UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

SR-6J

Tel: (312)886-7251

DATE:

TO: Carol Bass, 5204 G
U.S. EPA - HQ

FROM: Rosita Clarke-Moreno, SR-6J
Five Year Review Coordinator

THROUGH: William E. Muno, Director
Superfund Division

SUBJECT: **Transmittal of Five Year Review Report**
East Bethel Sanitary Landfill, MN

Region 5 is transmitting this Five-Year Review for the **East Bethel Sanitary Landfill, MN**, which has been accepted and approved. As per the 1995 Agreement between U.S. EPA and the MPCA Regarding Qualified Municipal Waste Landfills Under the Minnesota Landfill Cleanup Law (Agreement), part II.G.2. the State's Annual Report complies with the requirements of Five-Year Reviews. U.S. EPA, Region 5, has reviewed the enclosed document and accepts it as the required Five-Year Review for this site.

Enclosures (1)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604-3590

JAN 18, 2000

REPLY TO THE ATTENTION OF

SR-6J

Douglas Day, Supervisor
Closed Landfill Program
Minnesota Pollution Control Agency
520 Lafayette Rd. N.
St. Paul, MN 55155-4194

Re: East Bethel Sanitary Landfill Superfund Site
Five-Year Review Report

Dear Mr. Day:

The U. S. Environmental Protection Agency (U.S. EPA) has reviewed the Five-Year Review Report developed by the Minnesota Pollution Control Agency (MPCA) for the subject site. The report is hereby approved.

U.S. EPA appreciates the efforts of Jean Hanson in conducting this review. If you have any questions, please contact Gladys Beard at (312) 886-7253.

Sincerely,

William E. Muno, Director
Superfund Division

Attachment

Minnesota Pollution Control Agency

Office of the Commissioner

December 6, 2000

Mr. J. P. Singh, P.E.
EPA Agreement Coordinator
US EPA, Region 5
77 West Jackson Boulevard
Chicago, IL 60604

RE: Agreement Between EPA and MPCA Regarding Qualified Municipal Waste Landfills Under the Minnesota Landfill Cleanup Law
East Bethel Five-Year Review

Dear Mr. Singh:

The Minnesota Pollution Control Agency (MPCA) is pleased to present to the U.S. Environmental Protection Agency (EPA) the Closed Landfill Program's East Bethel Landfill Annual Report.

The 1995 Agreement Between the EPA and the MPCA Regarding Qualified Municipal Waste Landfills Under the Minnesota Landfill Cleanup Law (Agreement) identifies part II. G. 2. Five Year Review requirements. This item states the MPCA will submit ... "periodic review of remedial action required ... for any qualified landfill that is or was listed on the NPL for which a notice of compliance has been issued." It goes on to say the State's Annual Report must comply with the requirements under Section 121 (c) CERCLA, to fulfill the Five-Year Review requirement. This Five-Year Review takes into account previous comments provided by EPA regarding MPCA Annual Reports and the EPA's Five-Year Review requirements.

Please review and provide feedback or comments to Douglas Day, Supervisor in the Closed Landfill Program at 651/297-1780.

Sincerely,

Karen A. Studders
Commissioner

KAS:smm

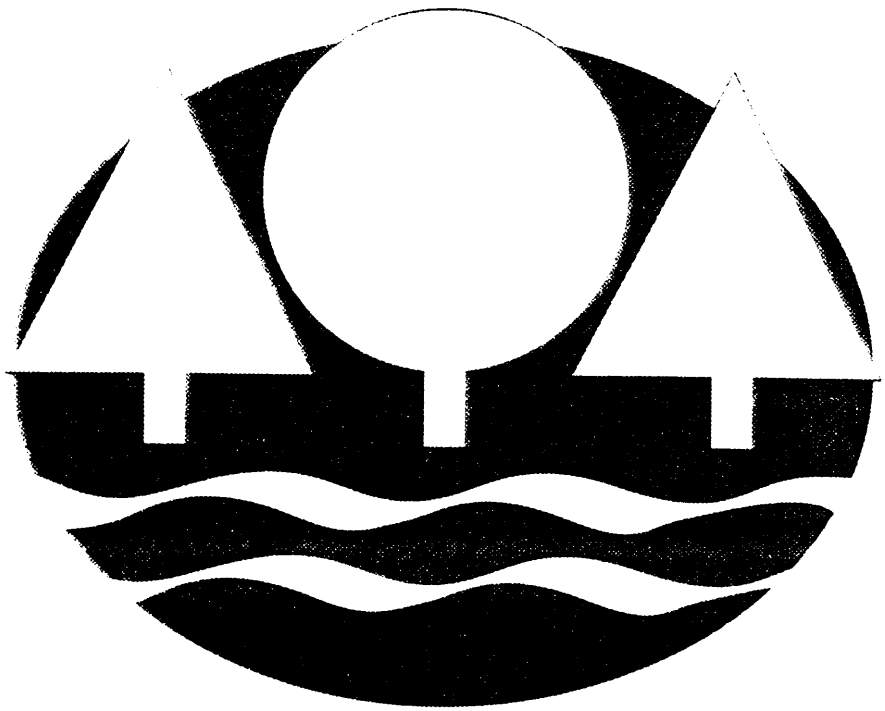
Enclosure

cc: Tibor Gallo, Minnesota Assistant Attorney General

Landfill Cleanup Program

1999 Annual Report SW-047

East Bethel Sanitary Landfill



Minnesota Pollution Control Agency

East Bethel Sanitary Landfill

SW-047
1999 Annual Report

Completed by
October 31, 2000

Project Leader: Jean Hanson
Hydrologist: Joe Julik
Engineer: Peter Tiffany
Regional Representative: Pat Hanson

Closed Unit Annual Report

Table of Contents

I. Site Background

The East Bethel Sanitary Landfill (Landfill), located in Anoka County, East Bethel Township (T33N, R23W, Sect. 8), received its first permit to accept waste on 11/18/71. The landfill reportedly accepted predominantly demolition debris. Limited amounts of industrial waste and municipal solid waste were accepted between 1969 and 1976 in a seven acre area in the southwest corner. The demolition landfill was closed in December 1995.

In accordance with the legislation enacted in 1992, (Minn. Laws 1992, Ch. 513, Art. 2, Sec. 2, Subd.3), the Minnesota Pollution Control Agency (MPCA) assessed and classified closed landfills in Minnesota. According to that assessment and classification, the East Bethel Sanitary Landfill has been rescored with a ranking of B and a score of 35. While this classification may be revised annually as needed, the rank of B indicates that this landfill may require additional remedial action to control gas migration and/or ground water contamination.

The East Bethel Sanitary Landfill is 34.7 acres in size and contains approximately 1,241,900 yards of waste. The Landfill was under private ownership when in operation. Sixty acres have been transferred to the MPCA with additional restrictions and easements on some of the adjoining property shown on Figure 1. The land titles for this property were recorded for the MPCA in 1999.

A forum is held annually among the staff members assigned to the East Bethel Sanitary Landfill to evaluate the status of this site. Additional information regarding the Closed Landfill Assessment can be found in the Closed Landfill Assessment Report (January 1995).

II. Site Engineering Summary

A. Landfill Cover Design / Construction Summary

The final cover was installed during the summer of 1995 by the owner. A diversion berm on the west side failed and a new downslope spillway consisting of a catch basin with a 15" pipe discharging to rip rap and a small sedimentation basin were installed. The landfill cover is currently maintained by the MPCA and its contractors. The landfill was mowed in August, 1999.

B. Leachate Management System Summary

1. Leachate Management System Maintenance Summary

The East Bethel Sanitary Landfill does not have a Leachate Management System for leachate collection.

2. Leachate Monitoring Summary

There are no leachate monitoring points at the East Bethel Sanitary Landfill.

C. Landfill Gas Management System Summary

1. Landfill Gas Management System Maintenance Summary

The East Bethel Sanitary Landfill has a passive gas venting system. There are no plans to install an active system as it is not believed to be technically warranted. This is due to the fact that most of the waste that went into this landfill was demolition debris, much of which does not degrade in such a way to produce significant amounts of methane gas.

2. Landfill Gas Monitoring Summary

There are currently no landfill gas monitoring points at the East Bethel Sanitary Landfill. The MPCA staff will contract to have approximately six methane monitoring probes installed around the perimeter of the landfill in 2000. This is being done to confirm that there is no off site migration of methane gas at this site. (Note: As of this writing, the gas investigative work is in progress) Findings of this monitoring will be available from the MPCA files and a summary of their findings will be included in next year's annual report.

D. Additional Maintenance Summary

A down slope spillway was added on the east side in 1996 at the owner's expense. The site was mowed annually since 1997. No trespassing signs were posted around the base of the fill.

E. Site Engineering Recommendations

The site will be inspected after mowing to evaluate the need for possible erosion and settling repair. New chain link fencing was install around much of the site in 1998. The site was surveyed at 2 foot contours in 1999. The top slope settlement will be corrected as necessary. Six gas probes will be installed in 2000.

F. Land Recovered for Beneficial Use

The landfill is currently open space and is used by a variety of wildlife including birds and deer. The MPCA staff are working with the MDNR, City of East Bethel and Anoka County on a cooperative project titled the Sandhill Crane Natural Area (SCNA) of which the landfill is a part. On October 26, 1999 the MPCA signed the SCNA Land Management Plan.

III. Site Environmental Monitoring Summary

A. Ground Water Monitoring / Remediation System Maintenance Summary

1. Ground Water Monitoring System Maintenance Summary

Five of the monitoring wells were redeveloped on September 17, 1997. Dedicated pumps were installed in November, 1997. No significant alterations were made to the ground water monitoring system in 1999.

2. Ground Water Monitoring Summary

Three rounds of water quality samples were collected by Interpoll Laboratories, Inc. (Interpoll) in 1999. The landfill monitoring system consists of 56 wells and one surface water sampling point. Six additional piezometers were used in determining water level elevations. Thirty-seven (37) wells were sampled as part of the 1999 sampling season. Some wells were removed from active sampling due to a long sampling record with no contaminant detection. Locations of each of the monitoring points are shown on the attached maps.

A table has been prepared to show groundwater elevation data for each of the wells monitored. Due to the installation of dedicated pumps and pump caps, the top of casing elevations may have changed up to two inches. Therefore water levels from these wells may be high, and the ground water flow contours may also be somewhat off. Review of ground water data indicates that the groundwater flow direction in the surficial aquifer was to the south-southwest and the flow direction in the deep aquifer was to the south-southwest. Based upon the ground water flow data, there were 3 upgradient wells, 29 downgradient wells and 16 wells that were side gradient to flow from the fill area.

The water quality analytical data obtained from the sampling events includes inorganic and organic sets. Water quality data collected from the existing monitoring system at the landfill site is tabulated and is found in the excel spreadsheet for this site (The entire spreadsheet is found in the electronic version of this report and/or in the MPCA files). Graphs showing

trends in water quality and ground water elevations are also included. Laboratory analyses of inorganic and organic parameters were performed by Minnesota Department of Health (MDH). Ground water samples collected from monitoring wells have shown impacts from organic and inorganic parameters. The Health Risk Limits (HRLs) have been exceeded at the permitted facility boundary for Volatile Organic Compounds (VOCs). VOC concentrations continue to show fluctuations due to the disturbances from the cover and pumpout systems. VOCs with the greatest number of exceedances of the HRLs are: benzene, 1,1-dichloroethane, 1,1-dichloroethylene, 1,2-dichloroethylene cis, and tetrahydrofuran.

The HRL for manganese was revised to a higher value of 1 mg/l in 1999. As a result, the number of HRL exceedances for manganese have been reduced by two-thirds but is still exceeded at several permitted facility compliance wells.

3. Ground Water Remediation System Maintenance Summary

The ground water remediation system consists of 7 pumpout wells. The wells were acidized and the pumps and discharge lines cleaned in 1999.

4. Ground Water Remediation Summary

Approximately 14.7 million gallons of water were pumped in 1999. The pumpout wells effectively capture the ground water plume during operation, however improvements in water quality have not been significant. The pumpout system was constructed during the summer of 1994, and has been operated during the summers of 1995-1999. Continued operation of the system is required to prevent the ground water plume from the landfill from impacting downgradient residences and Ned’s Lake.

The system consists of 7 pumpout wells which pump water to an aeration tank for removal of the VOCs. (Historically, the next treatment steps included cationic and anionic polymers are added to flocculate the iron and carbonate, and the sludge is settled, filtered, and excess liquid pressed out. The sludge was stored in a rolloff box until sufficient volume has been reached for disposal. The final discharge water then flowed by gravity to Ned’s Lake.) Now, since 1998, the iron and carbonate precipitate in a settling/infiltration pond and the water either infiltrates back into the aquifer and/or in instances of high precipitation discharges to a constructed wetland and possibly Ned's Lake.

An NPDES permit from Water Quality sets the criteria on inorganic parameters and VOCs for discharge of the treated water into the lake. Pumpout water cannot be discharged directly to Ned's Lake because of the high levels of VOCs, iron and total suspended solids (TSS). After the aeration tank removes the VOCs, further treatment is necessary only because the discharge water is still high in iron and TSS. The East Bethel treatment system has an average influent containing 18 to 20 mg/L of iron and 43 to 52 mg/L of total suspended solids. New NPDES discharge standards include 30 mg/L of TSS and 1.245 mg/L of dissolved iron.

The treatment system described above was difficult to operate properly and required frequent maintenance. The system was designed to operate at 100 gallon per minute (gpm) for seven months of the year. Therefore the capture zone was modeled based on these rates and a total of 30 million gallons of water. However, due to cycling of the pumps off and on in the wells, the average flow rate has been closer to 60 gpm, which totals about 15 million gallons a year. Increased flow rates do not appear to be feasible due to lower transmissivities southwest of the landfill. Adverse weather conditions in the spring during some years have delayed startup of the system until May. However, the greatest infiltration and runoff occur in April. A longer pumping season of at least eight months is needed to maintain the capture

capture zone. An earlier startup in the spring is particularly important in order to capture infiltration from the snow melt.

Since the water quality and geology is very similar to the Isanti-Chisago system, a decision was made by the East Bethel site team to construct a similar system at East Bethel. Water is now discharged to a settling / infiltration pond instead of removing the iron and suspended solids with the present treatment system. Design for the pond size and placement and modifications to the plumbing system was done in 1997/8, and construction is now complete. The present pumpout well system and aeration tank and blowers will be kept. Removal and sale of other portions of the present treatment system will be made after discharge from the new system has operated for a season and been proven to meet water quality requirements. Arrangements for this decommissioning of equipment is now being made.

There have not been treatment system effluent samples taken since the system was changed as there has not been any water discharged to either the wetlands or Ned's Lake. This is because all discharge water has either infiltrated into the ground through the base of the stabilization pond and/or evaporated. A sampling weir is being considered which would allow for estimating what the discharge water quality would be if discharge occurred.

5. Monitoring System Modifications

Some of the older shallow monitoring wells east of the fill area are scheduled to be abandoned. The old "shop well" will be abandoned in 2000.

B. Surface Water Monitoring Summary

One surface water point was monitored at the Ned's Lake. It showed no impacts to water quality due to the landfill. In addition the effluent from the treatment system is also monitored. A graph showing the water level of Ned's Lake has been attached.

C. Additional Monitoring Summary

A list of the residential wells which are included in the monitoring system for the East Bethel Sanitary Landfill included: RW-5, RW-6, RW-7, RW-8, and RW-20. Residential water samples have shown no impacts from the landfill. Residential well monitoring has been reduced to once per year.

D. Site Monitoring Recommendations

Continue monitoring in 2000. Add another monitoring well on the southwest side of the landfill to verify pumpout system effectiveness.

IV. Inspections

Quarterly inspections related to landfill conditions have been completed and reports are in the files. No outstanding inspection issues were noted in 1999.

V. Required Permits

The DNR Water Appropriation Permit and NPDES Permit have been transferred to the MPCA Solid Waste Section. Reports are filed annually and quarterly.

IV. Recommendations Summary:

Continue monitoring ground water and operating the pumpout system. Some of the older shallow monitoring wells east of the fill area, as well as an old on-site production well are scheduled to be abandoned. The MPCA staff will continue working with the MDNR, City of East Bethel and Anoka County on a cooperative project titled the Sandhill Crane Natural Area (SCNA). Six gas probes will be installed in 2000. Any erosion and/or settlement of the cover system will be corrected as needed. The SCNA Land Management Plan which includes the East Bethel Landfill was signed on October 26, 1999.

VII. Certifications

A. Hydrogeologic Certification

I certify, that the hydrogeologic portions of this document and all attachments, were prepared under my direction or supervision under a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Furthermore, I certify that I am knowledgeable in the field of hydrogeology.

Name: Joe Julik	**Title:** Hydrogeologist	**Date:** October 31, 2000
Mailing Address: 520 Lafayette Road, St. Paul, MN 55155		**Phone:** 296-8454
Signature:		

B. Engineering Certification

I certify, that the engineering portions of this document and all attachments, were prepared under my direction or supervision under a system designed to assure that qualified personnel gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Name: Peter Tiffany	**Title:** Engineer	**Date:** October 31, 2000
Mailing Address: 520 Lafayette Road, St. Paul, MN 55155		**Phone:** 296-7274
Signature:		

C. Annual Report Certification

I certify, that this document and all attachments, were prepared under my direction or supervision under a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Name: Jean Hanson	**Title:** Project Leader	**Date:** October 31, 2000
Mailing Address: 520 Lafayette Road, St. Paul, MN 55155		**Phone:** 296-7390
Signature:		

D. Field Inspection Certification

I certify, that this document and all attachments, were prepared under my direction or supervision under a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete

Name: Pat Hanson	**Title:** Field Inspector	**Date:** October 31, 2000
Mailing Address: 520 Lafayette Road, St. Paul, MN 55155		**Phone:** 296-7740
Signature:		

E. Five Year Review

Authority and Purpose

Section 121 (c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by SARA and Section 300.430(f) (4) (ii) of the National Contingency Plan (NCP), require that periodic (no less often than five years) reviews are to be conducted for sites where hazardous substances, pollutants or contamination remain at the site above levels that will not allow for unlimited use or unrestricted exposure following the completion of remedial actions for the site. The purpose of a statutory five-year review is to evaluate whether the remedial action remains protective of human health and the environment. This review focuses on the protectiveness of the East Bethel Landfill, located in East Bethel, Minnesota. This review will be placed in the Site files and local repository for the East Bethel Landfill at 77 W. Jackson, Chicago, IL 60604.

The United States Environmental Protection Agency (U.S. EPA) has established a three-tier (with a sub-tier for Tier 1) approach to conducting Five-Year Reviews, the most basic of which provides a minimum protectiveness evaluation for sites with on-going response actions at the site (Level I review). U.S. EPA contemplates that a Level I review will be appropriate in all but a relatively few cases where site-specific considerations suggest otherwise. The second and third levels (Level II and Level III) of review are intended to provide the flexibility to respond to varying site-specific considerations, employing further analysis. Site specific considerations, including the nature of the response action, the status of the on-site response activities, and the proximity to populated areas and sensitive environmental areas determine the level of review for a given site. A Level I review was conducted for this site.

Statement of Protectiveness

The Record of Decision (ROD) for the East Bethel Landfill was signed by the US EPA on December 30, 1992. The ROD identified two operable unit to be addressed as part of remediaiton of this site.

The Record of Decision (ROD) for the Operable Unit (Ground Water Contamination) consisted of the following elements:

1) Ground Water Pump and Treat System and
2) Long term groundwater monitoring program to assess trends in water quality downgradient of the landfill.

The ROD for the Operable Unit Two (Source of Contamination) consisted of the following elements:

1) High permeability sand layer to promote passive gas venting;
2) Synthetic landfill cap (40 mil. HDPE) to prevent infiltration of precipitation;
3) Rooting zone soils;
4) Top soils;
5) Passive gas vents connected by lateral lines.

By limiting infiltration this cover system limits the generation of landfill leachate that contributes to groundwater contamination.

There are no residences impacted by the East Bethel Sanitary Landfill, either by a potential risk due to drinking groundwater or exposure to landfill gas. However, there is some VOC contamination in the aquifer downgradient of the fill area. The contamination is limited to within a few hundred feet of the fill area.

The ground water pump and treat system has been operating since 1994. The treatment system was redesigned in 1998 to make the operation more cost effective without changing it's effectiveness.

The Long-term monitoring of the ground water system is ongoing quarterly at the Landfill. Long-term groundwater monitoring has demonstrated that the chemicals of concern have declining to below appropriate ARARs. Long-term trends show significant and adequate improvements in ground water quality.

The source control provided is a low permeability cover over the Landfill which has achieved its design criteria by significantly reducing both the production of leachate and the toxicity of the compounds released from the Landfill. Since the cover was constructed, there has been significant reduction in the contaminant concentrations in the ground water monitoring wells.

A network of gas monitoring probes will be installed around the Landfill during 1999 which are designed to detect migration of landfill gas, specifically methane, away from the fill area. There are no buildings or other receptors within ¼ mile of the fill area. Also, the MPCA will be conducting studies designed to examine the feasibility of converting the passive gas system to an active gas system over the next two years.

The landfill cover is mowed annually. The cover is inspected for erosion or other damage and repairs are made when and where necessary to maintain the integrity of the cover system, including maintaining proper slopes for positive drainage off the fill area.

The next five year review will be completed by February 11, 2004.

Name: Karen A. Studders	**Title:** Commissioner	**Date:** 12/1/99
Mailing Address: 520 Lafayette Road, St. Paul, MN 55155		**Phone:** 651-296-7301
Signature: Karen A Studders		

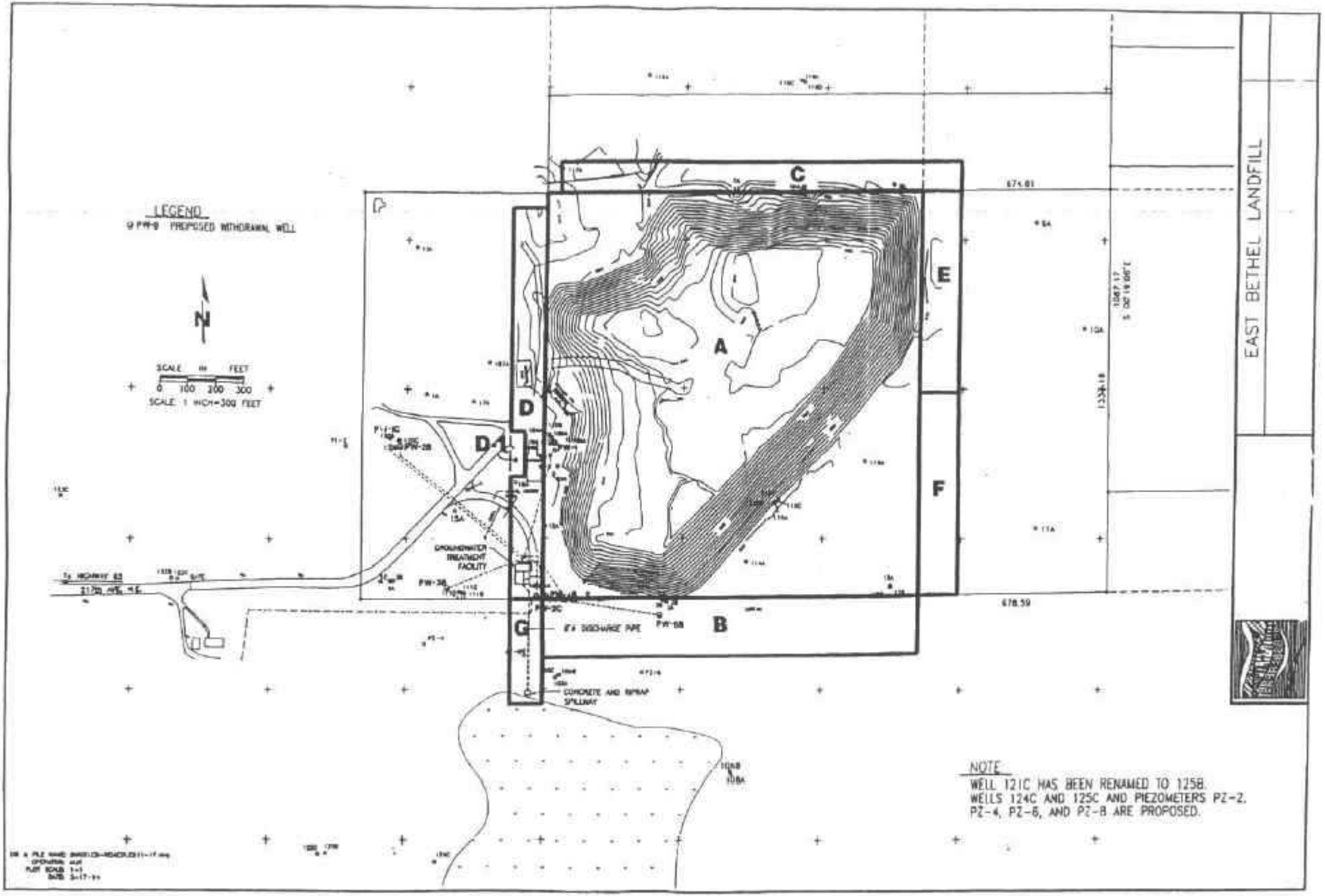
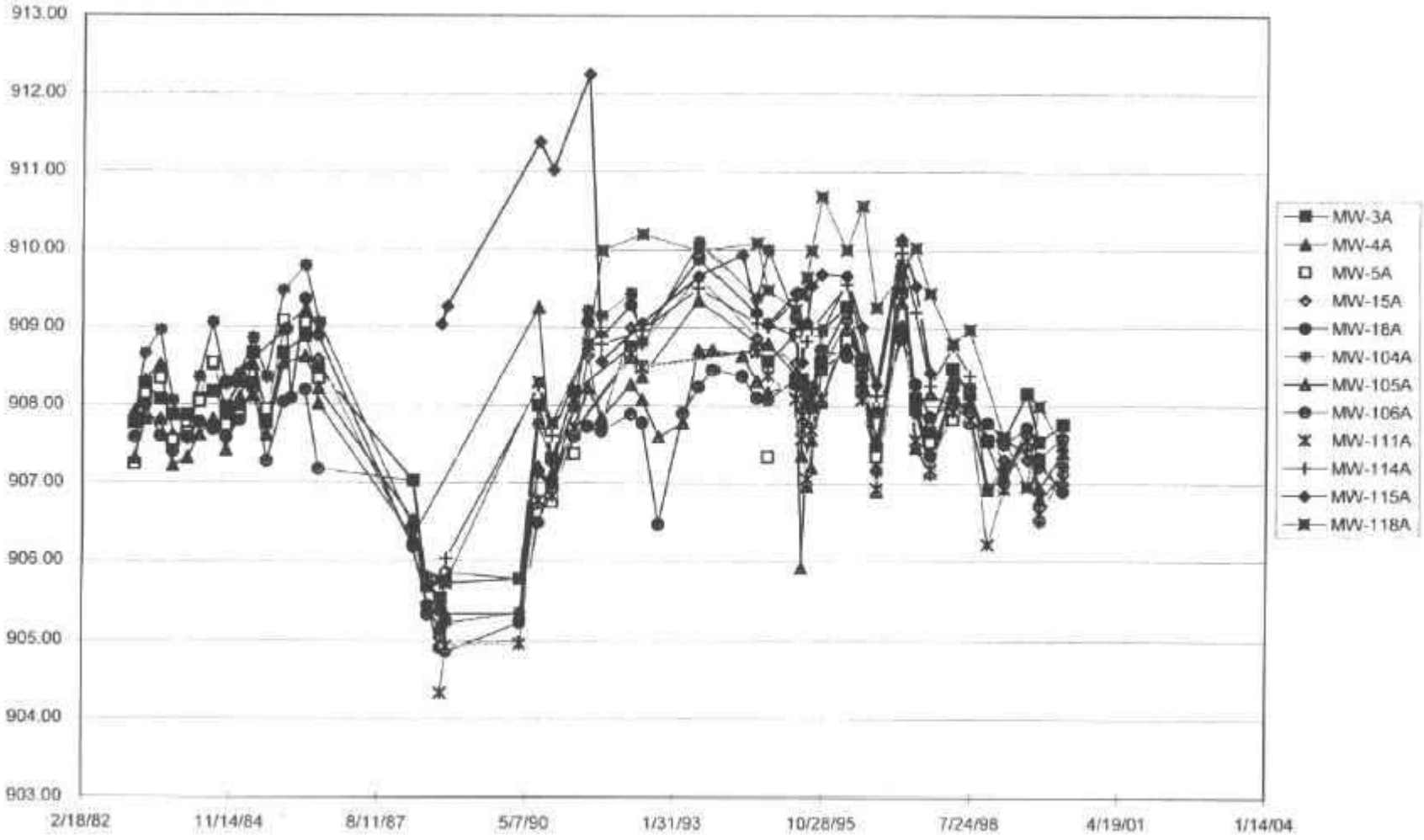

LEGEND
PW-9 PROPOSED WITHDRAWAL WELL
N
SCALE IN FEET
0 100 200 300
SCALE 1 INCH=300 FEET
EAST BETHEL LANDFILL
A
B
C
D
D-1
E
F
G
GROUNDWATER TREATMENT FACILITY
CONCRETE AND RIPRAP SPILLWAY
NOTE
WELL 121C HAS BEEN RENAMED TO 125B.
WELLS 124C AND 125C AND PIEZOMETERS PZ-2, PZ-4, PZ-6, AND PZ-8 ARE PROPOSED.

Figure 1

East Bethel A Water Levels (1)



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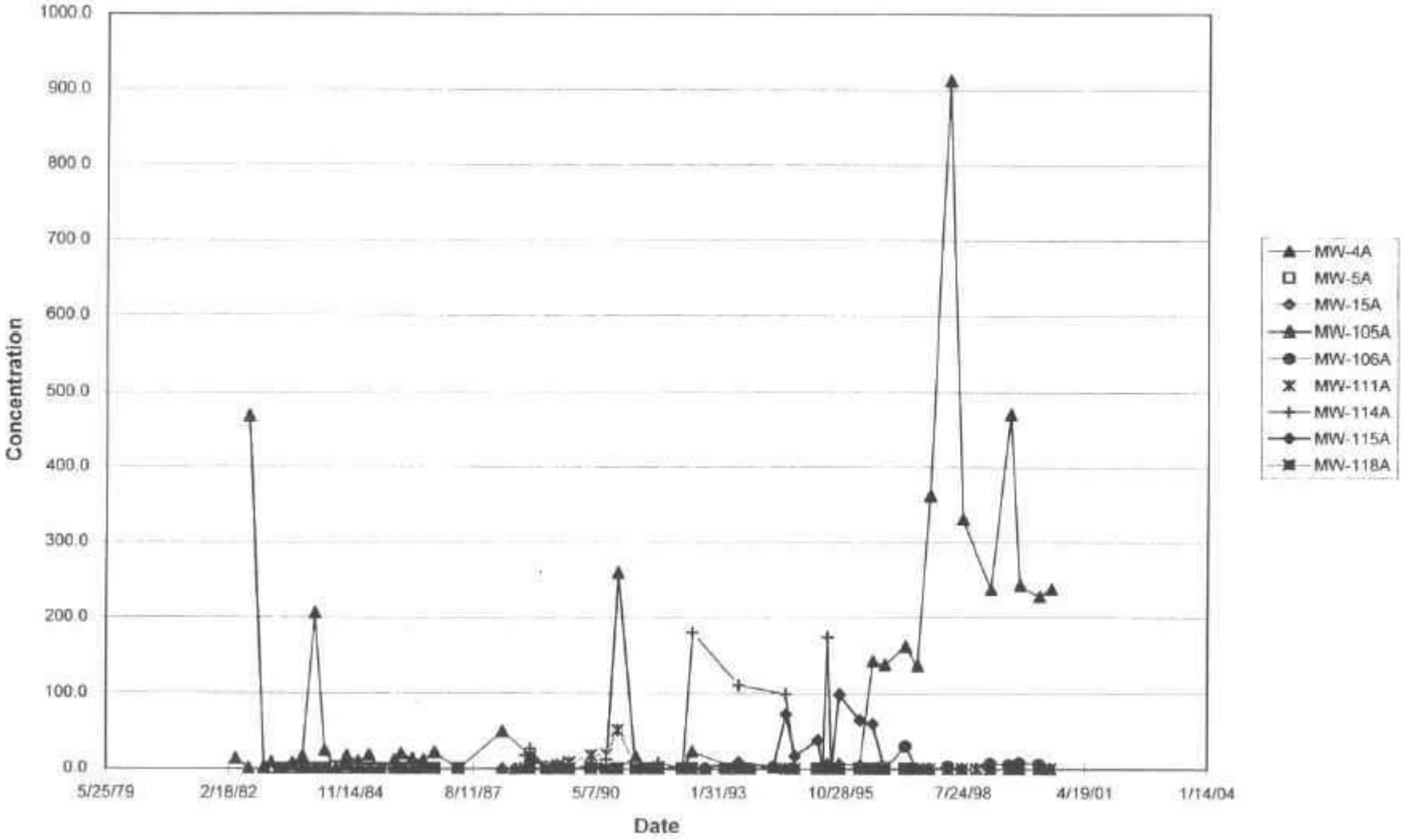
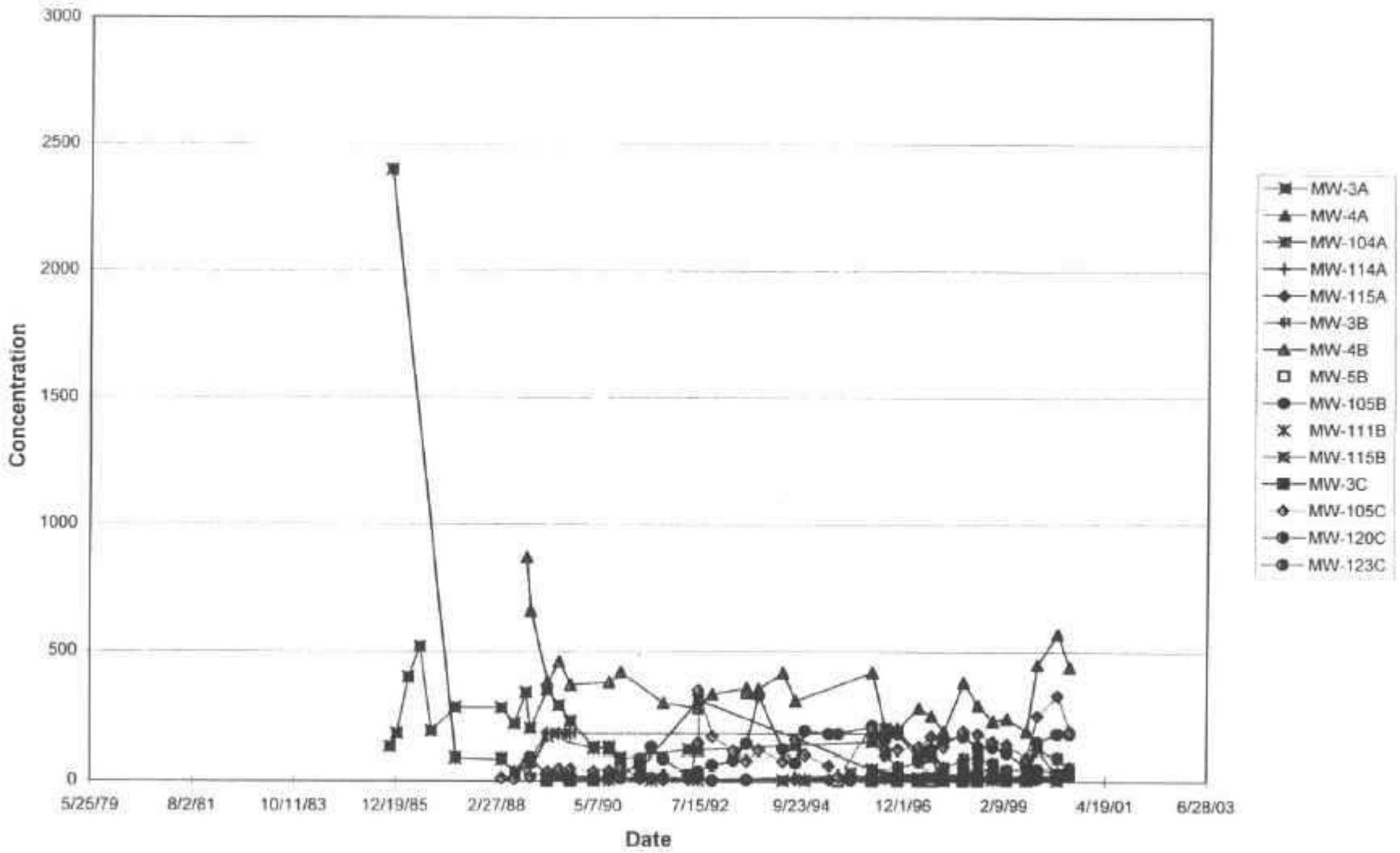


East Bethel Ethyl Ether



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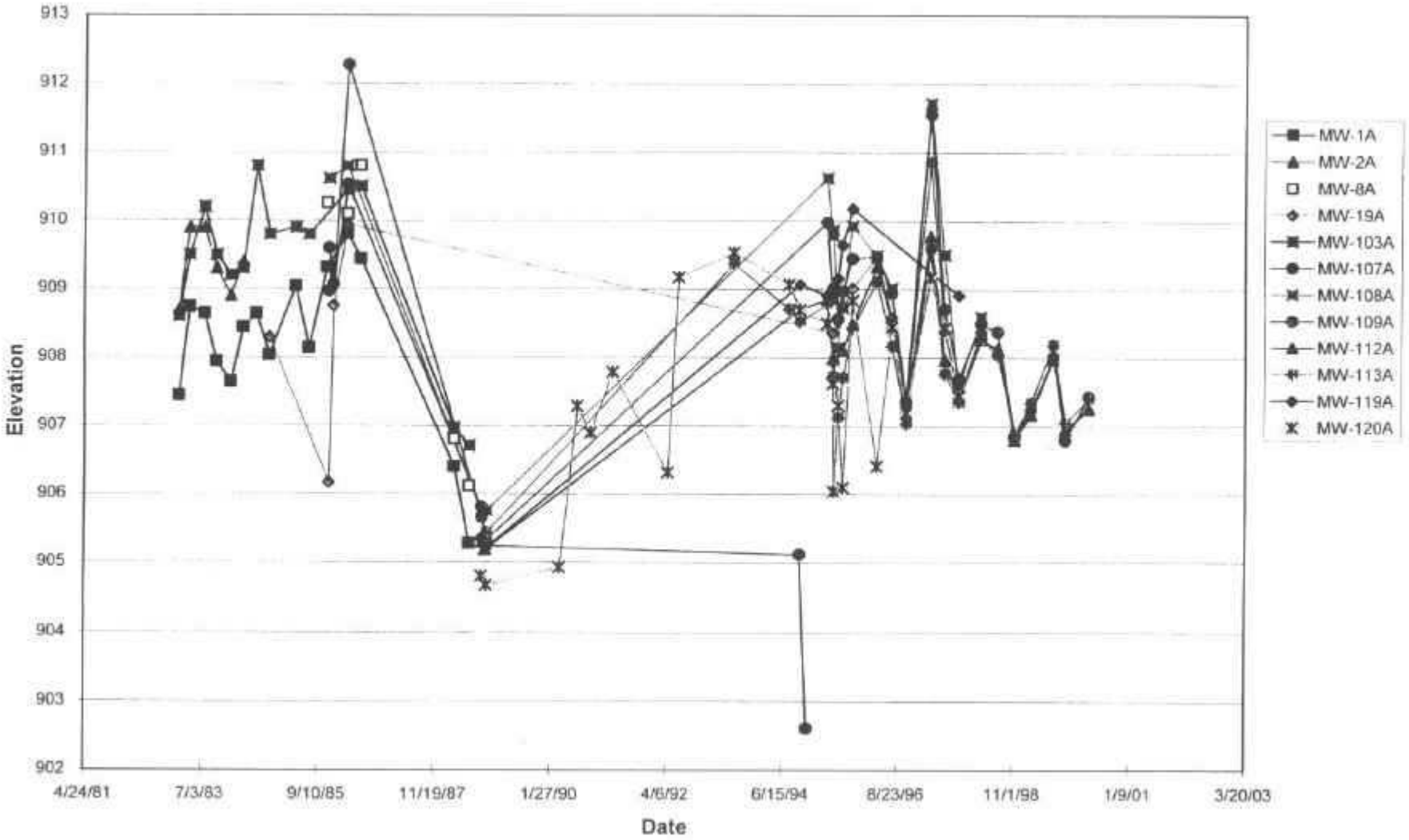

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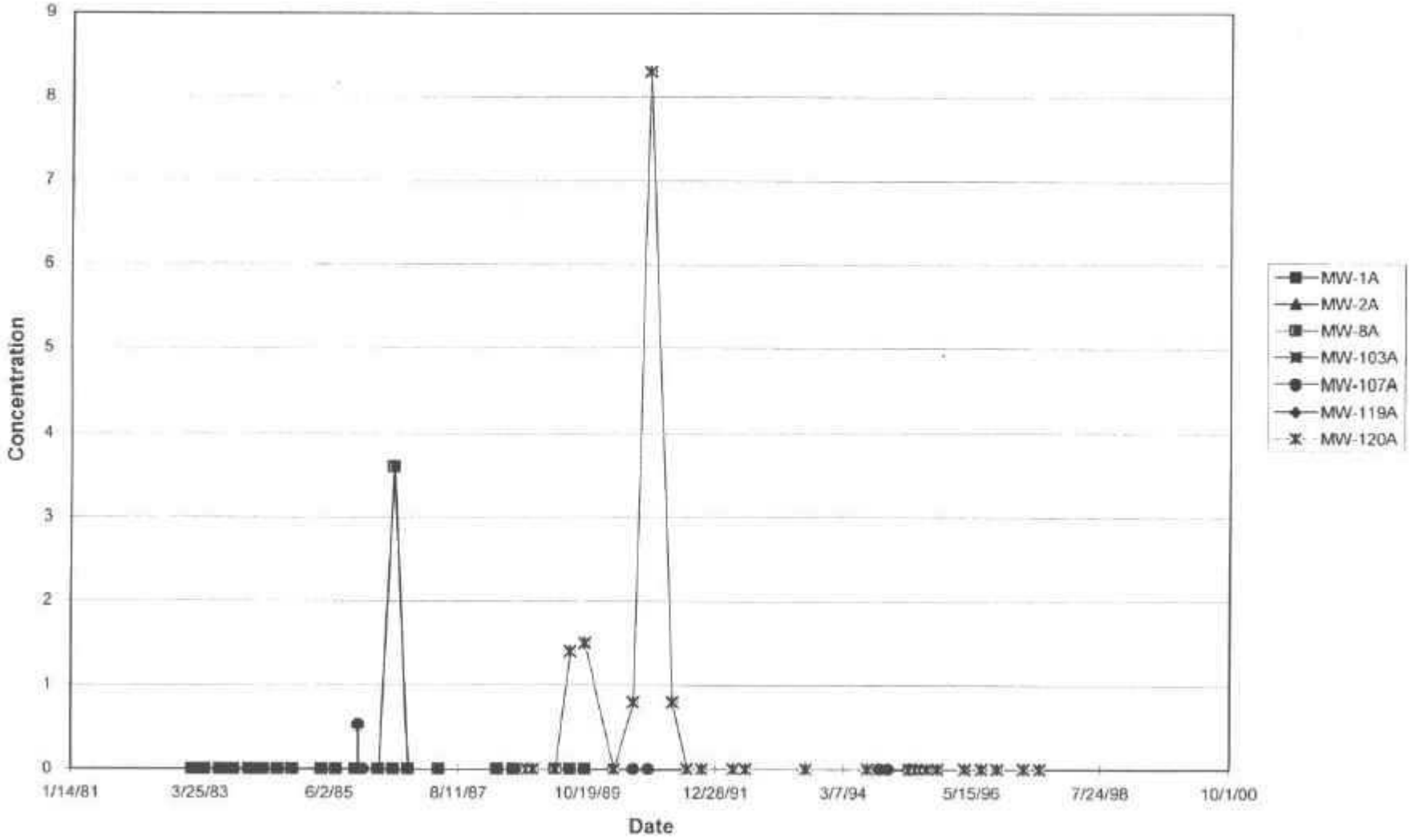

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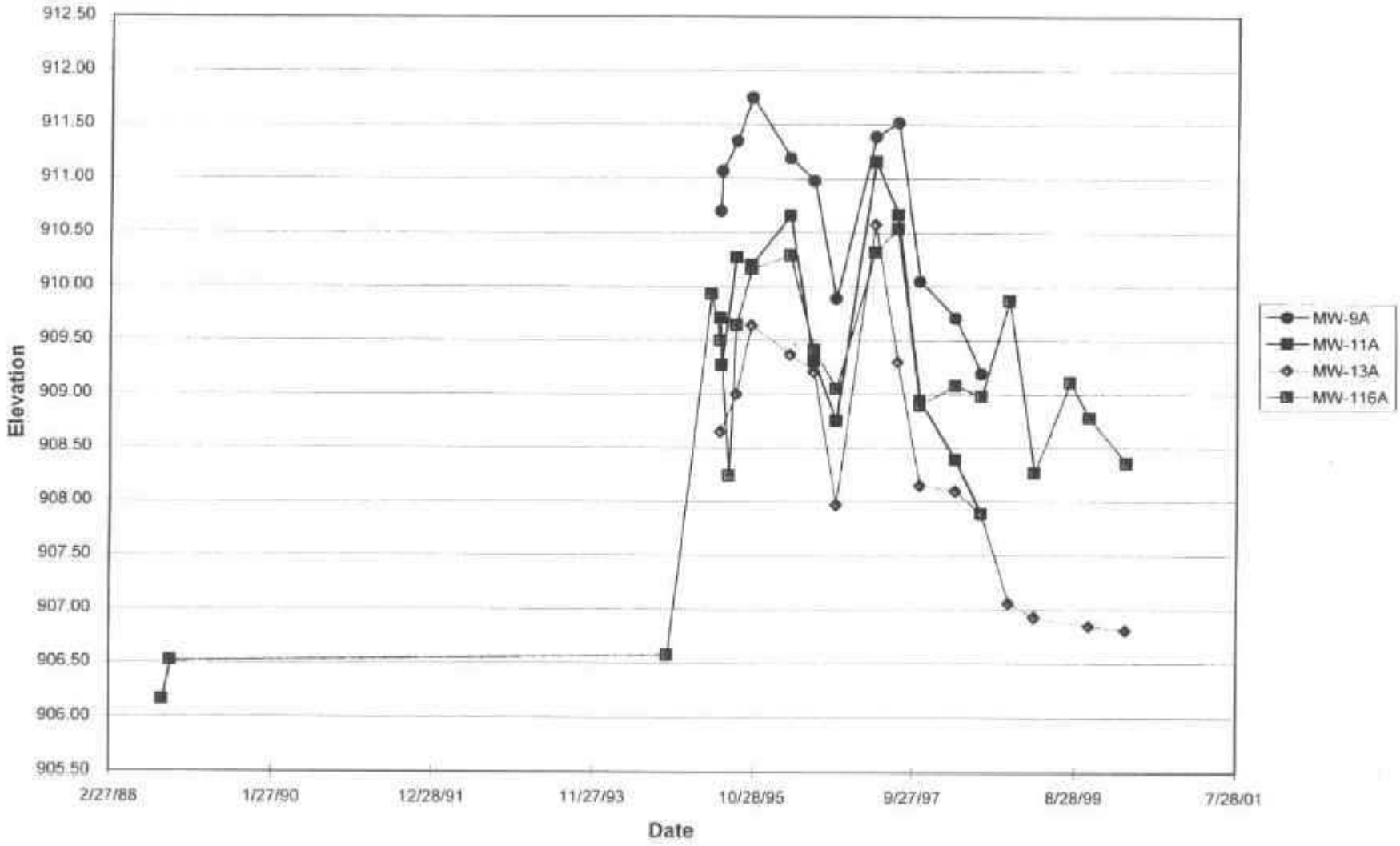

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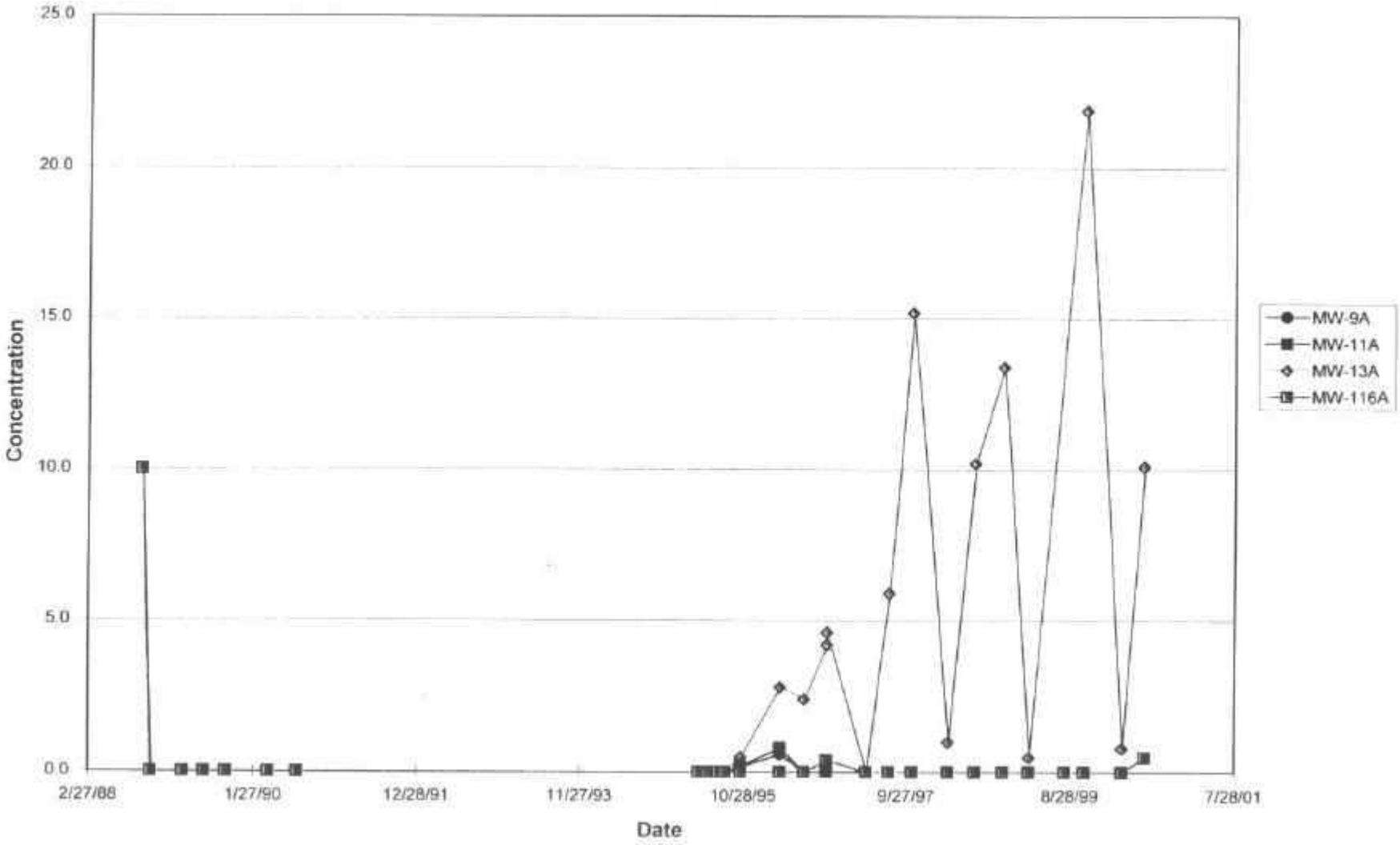

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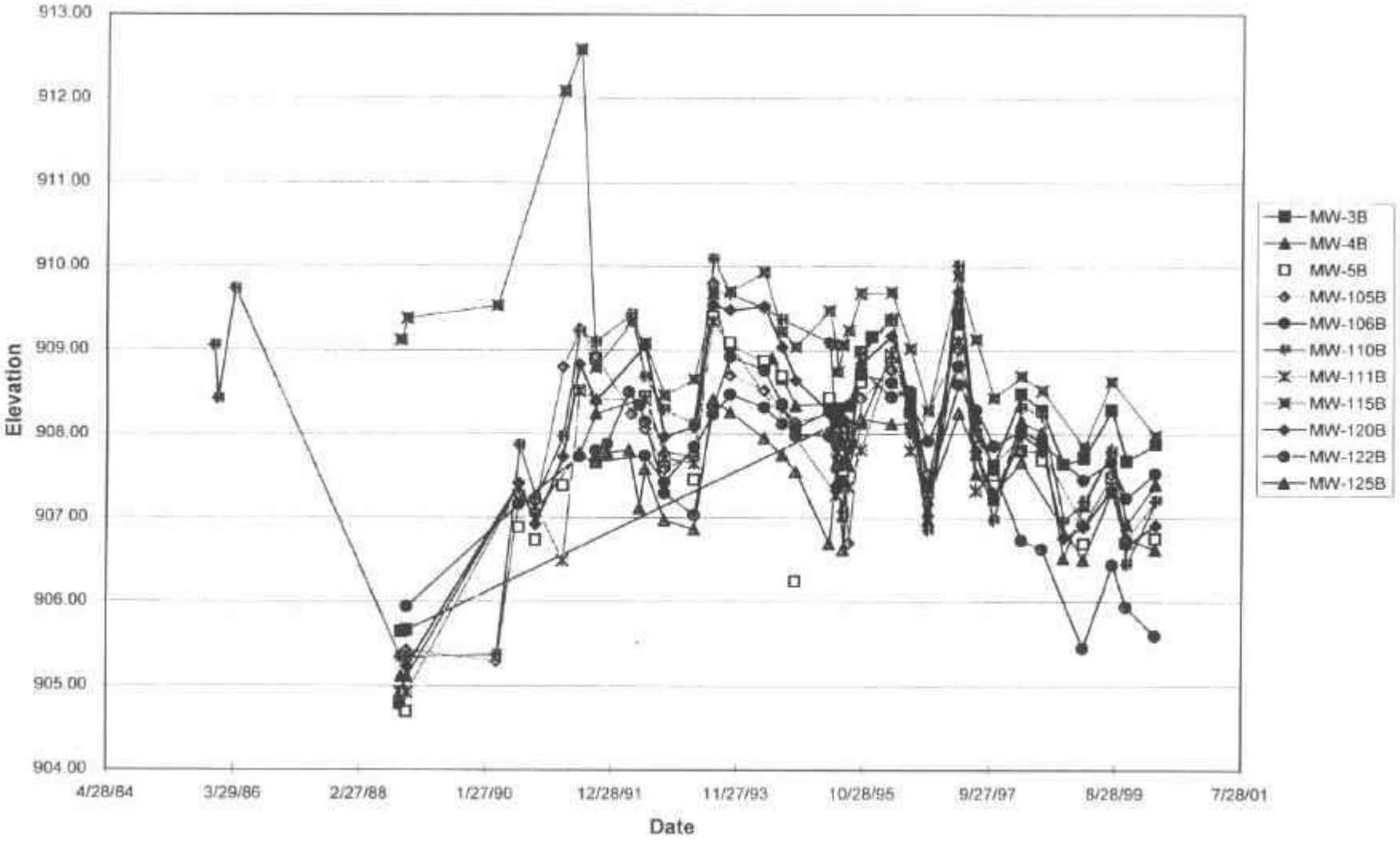

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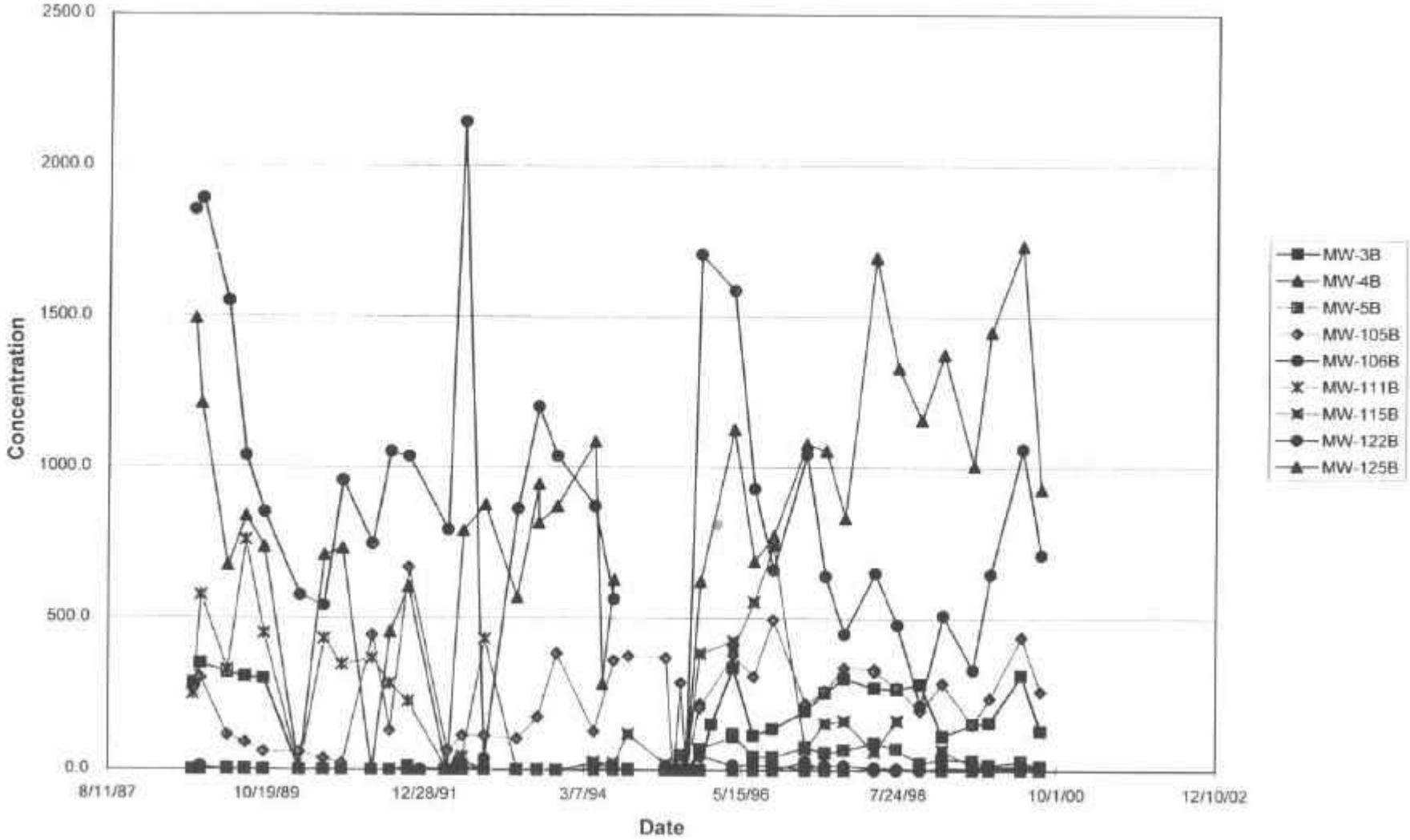

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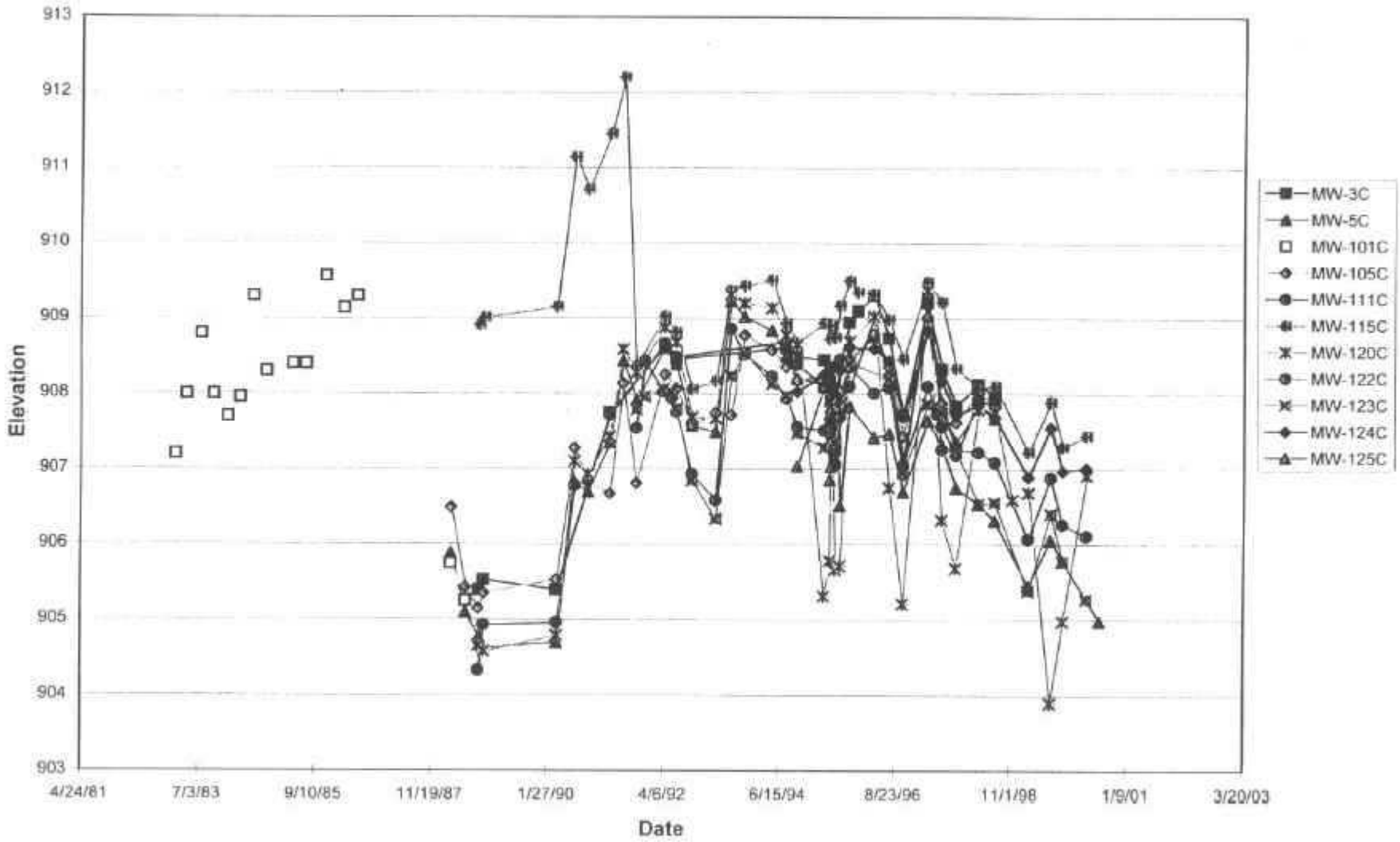

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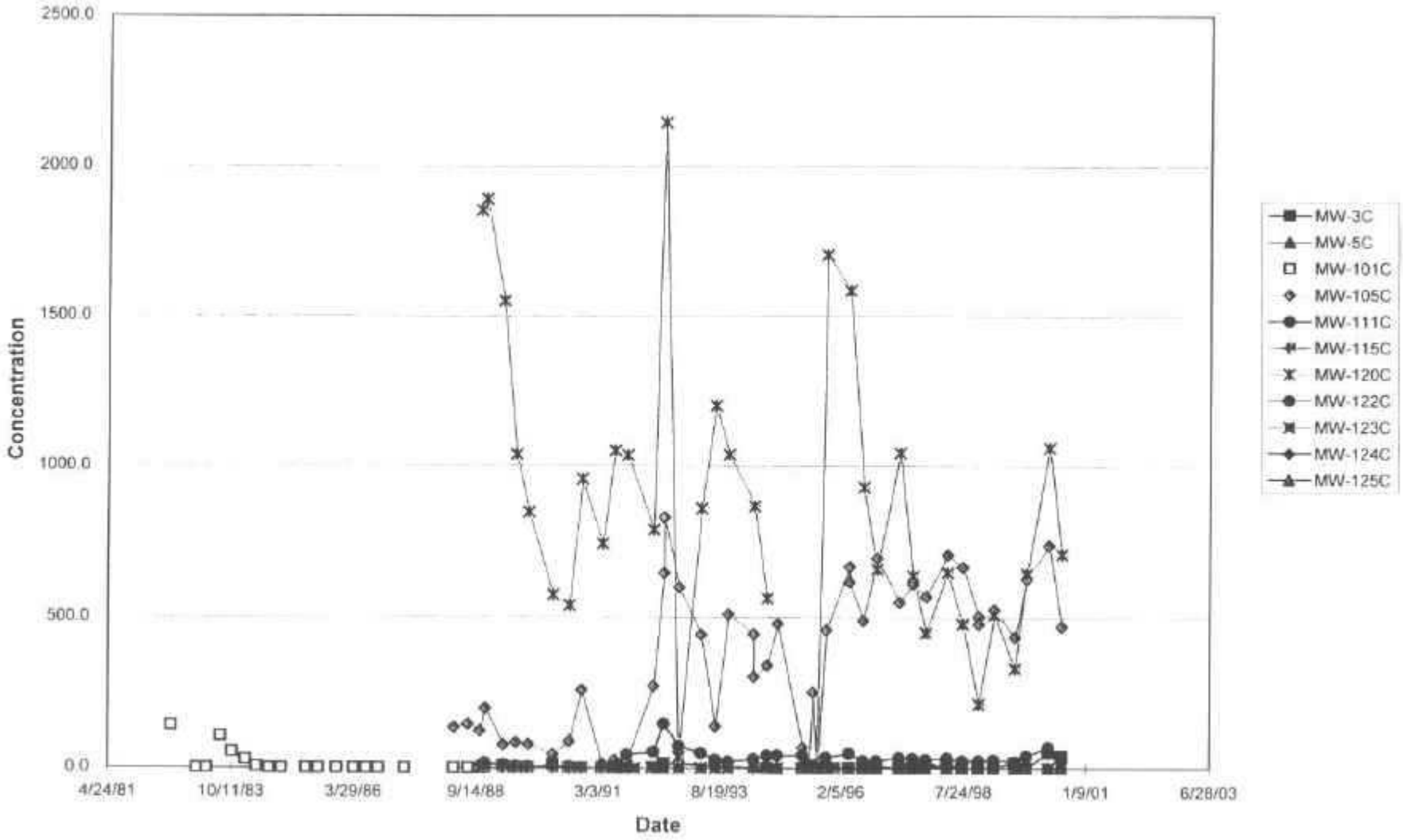

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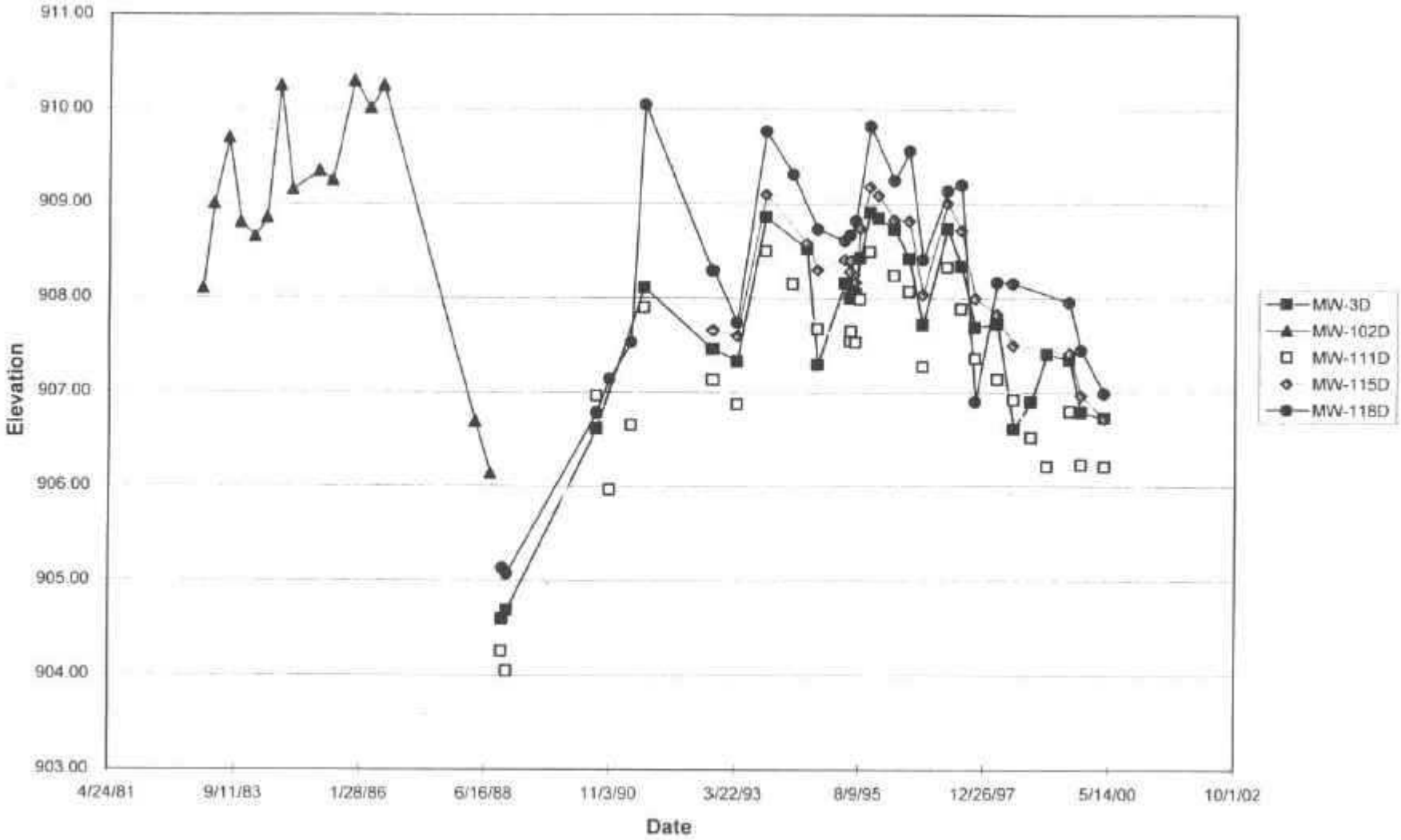
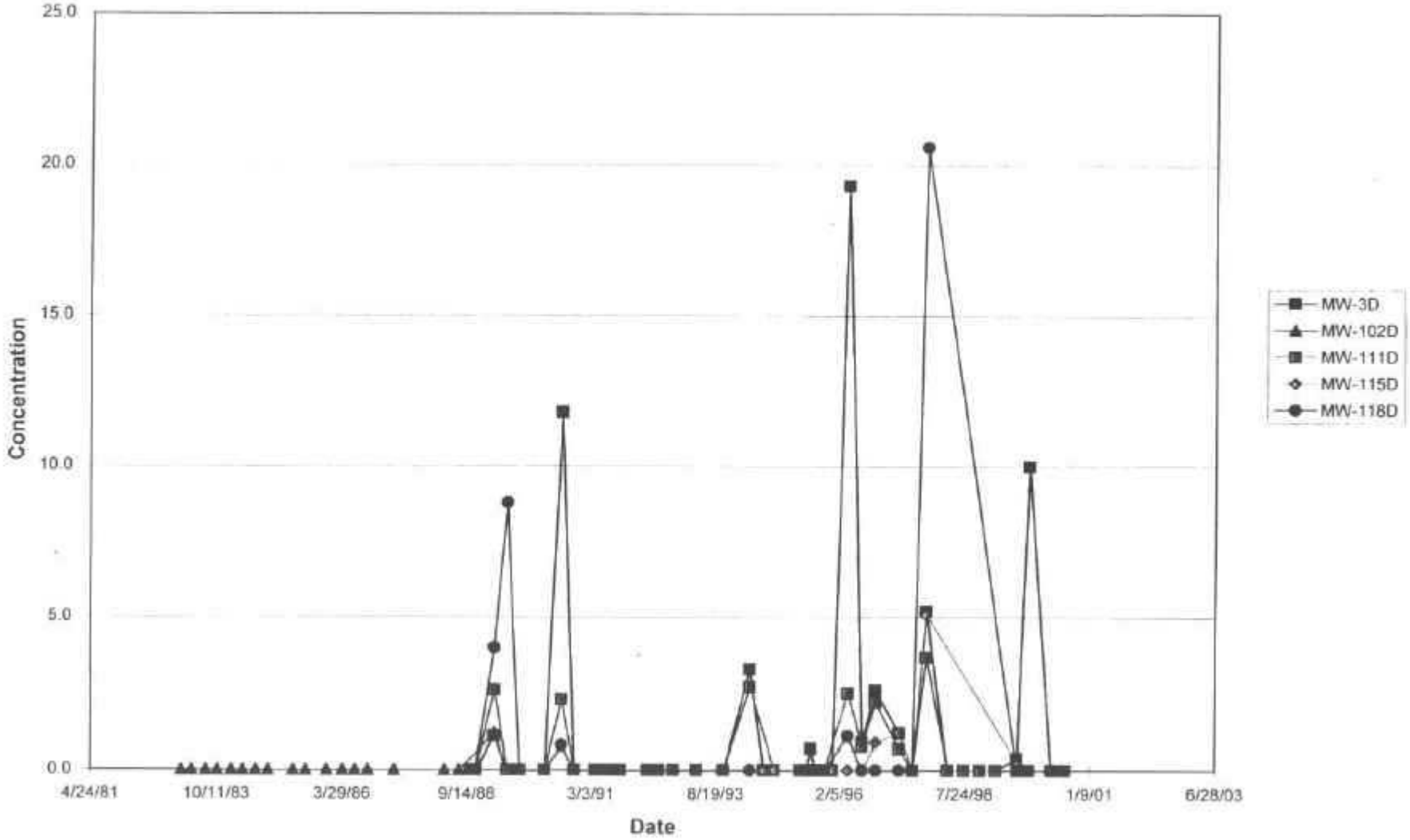


East Bethel Bedrock VOCs



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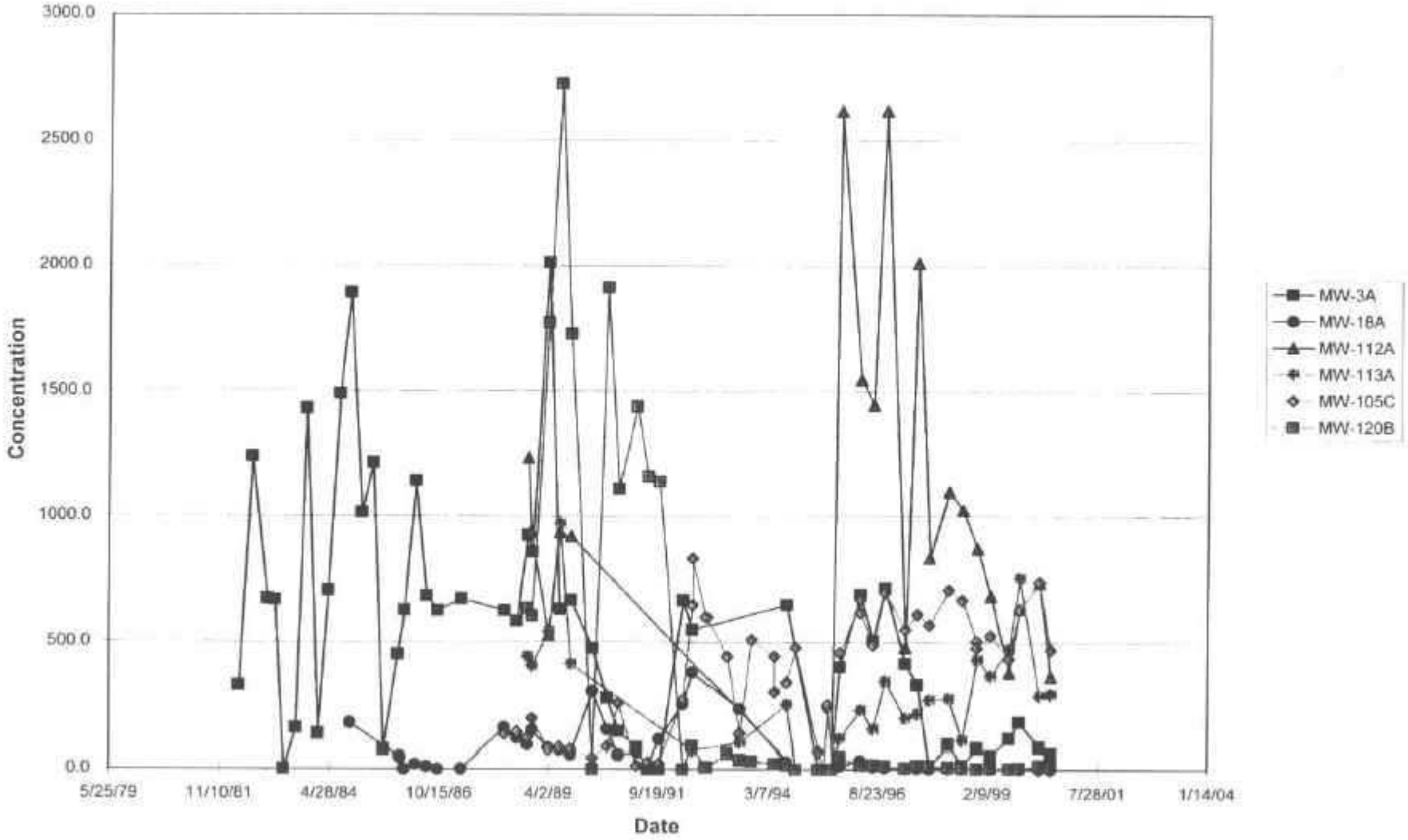
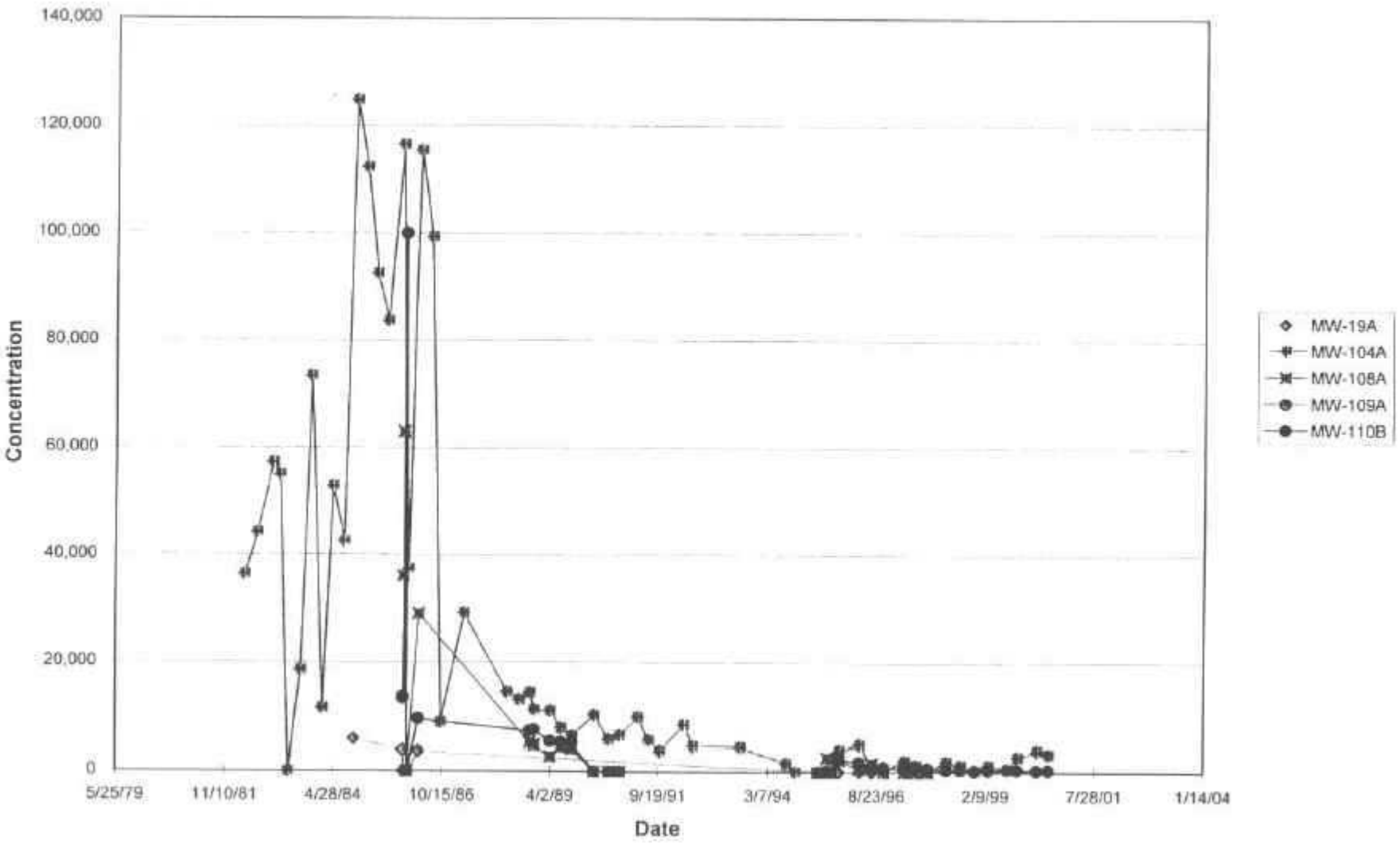
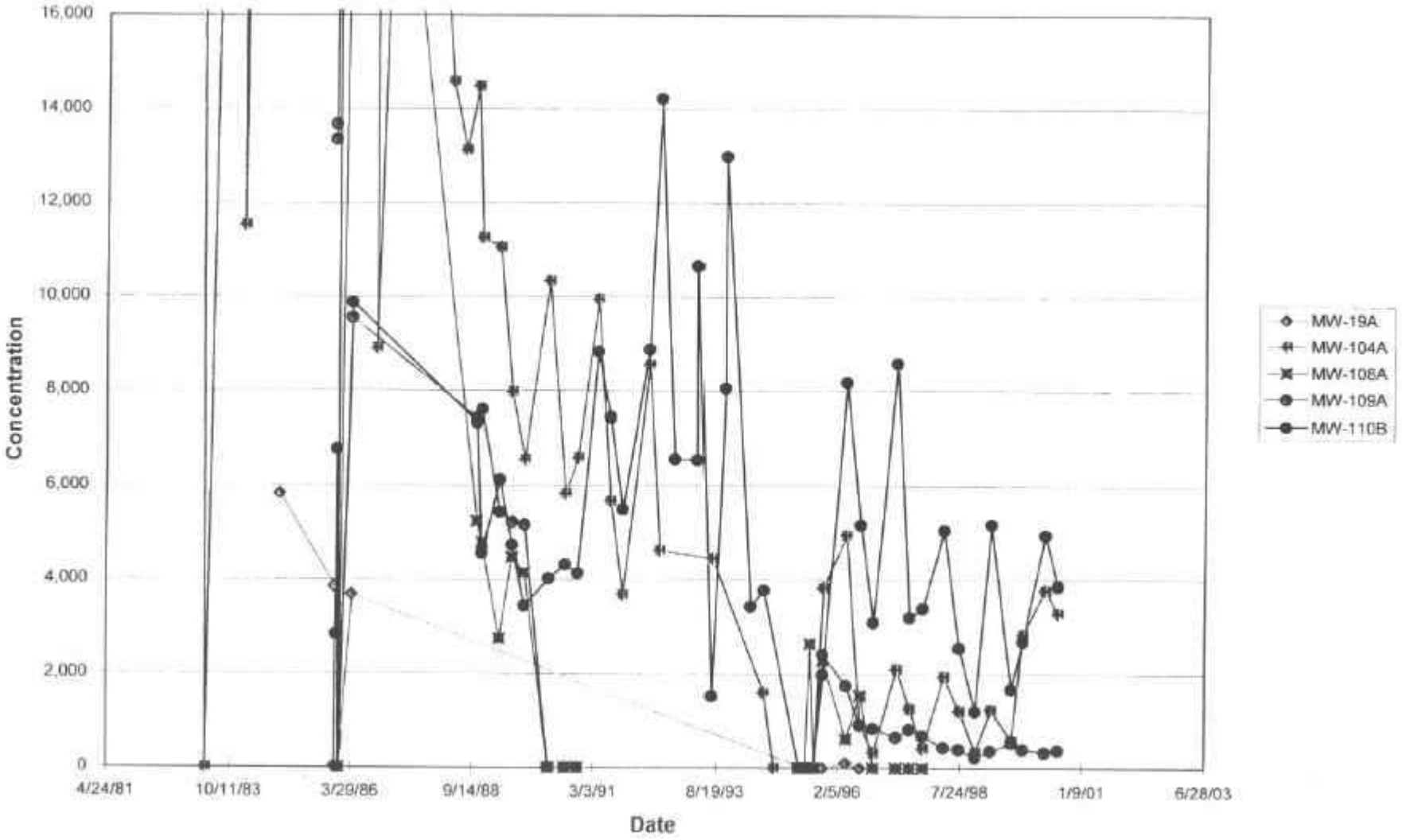


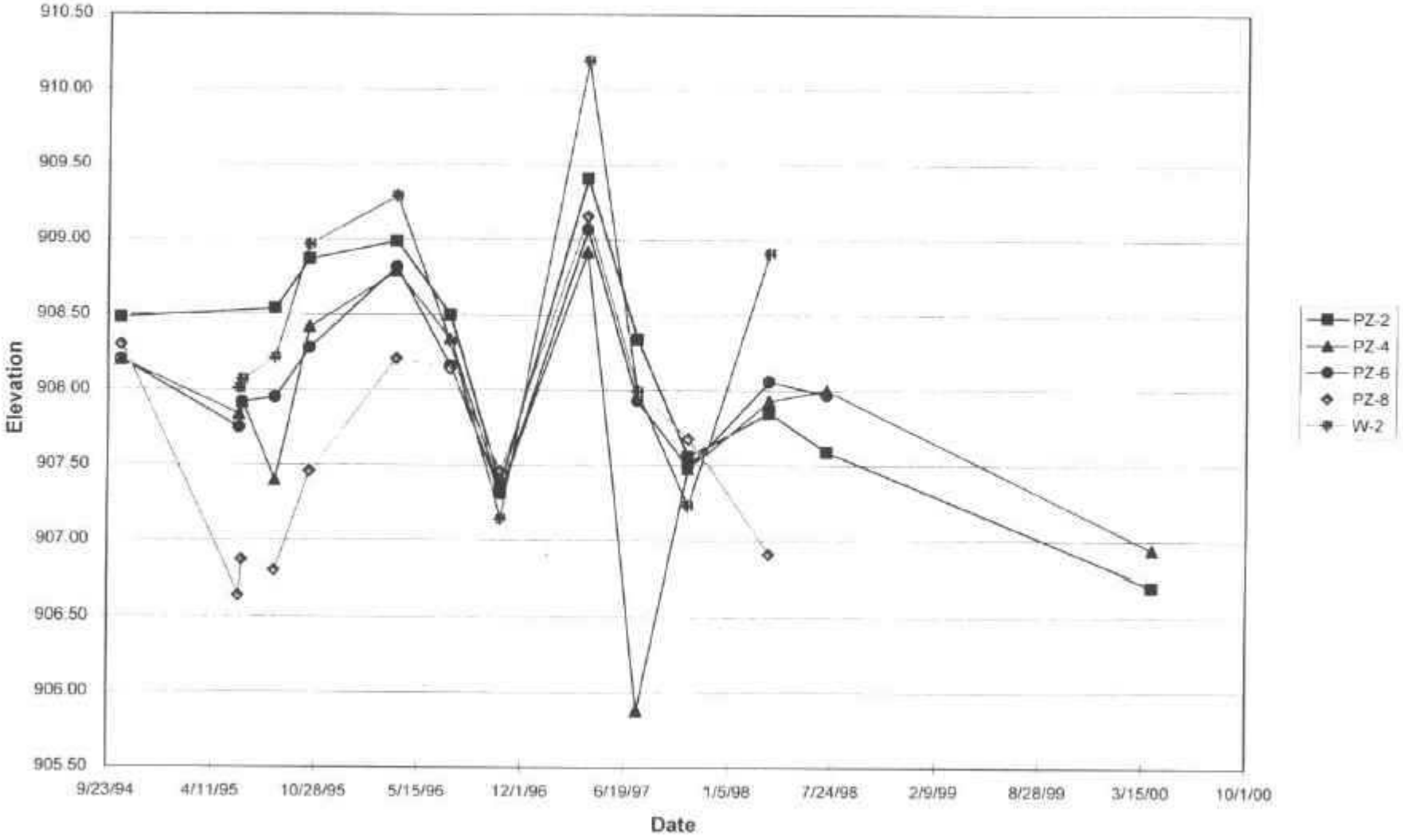
East Bethel VOCs High



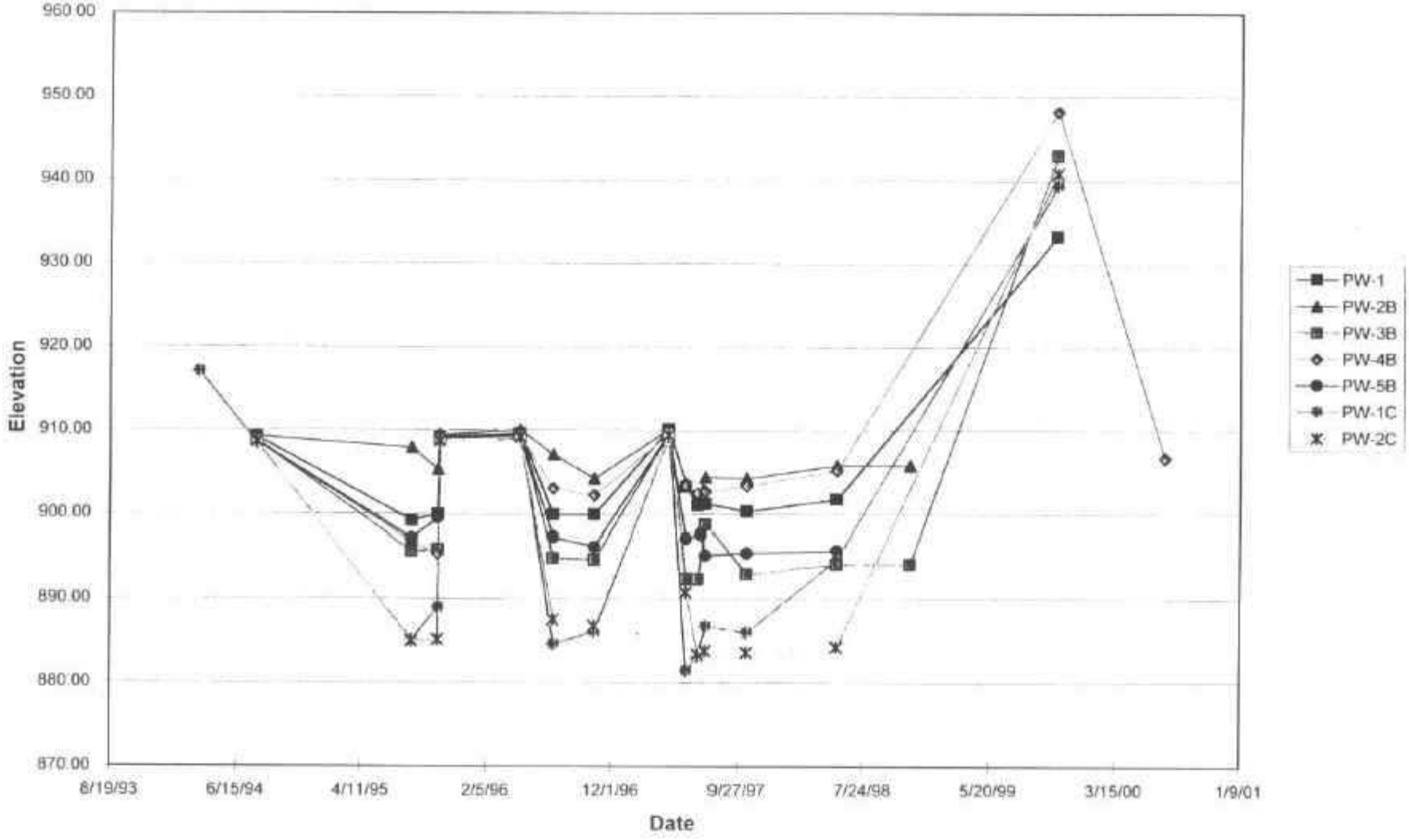
East Bethel VOCs High



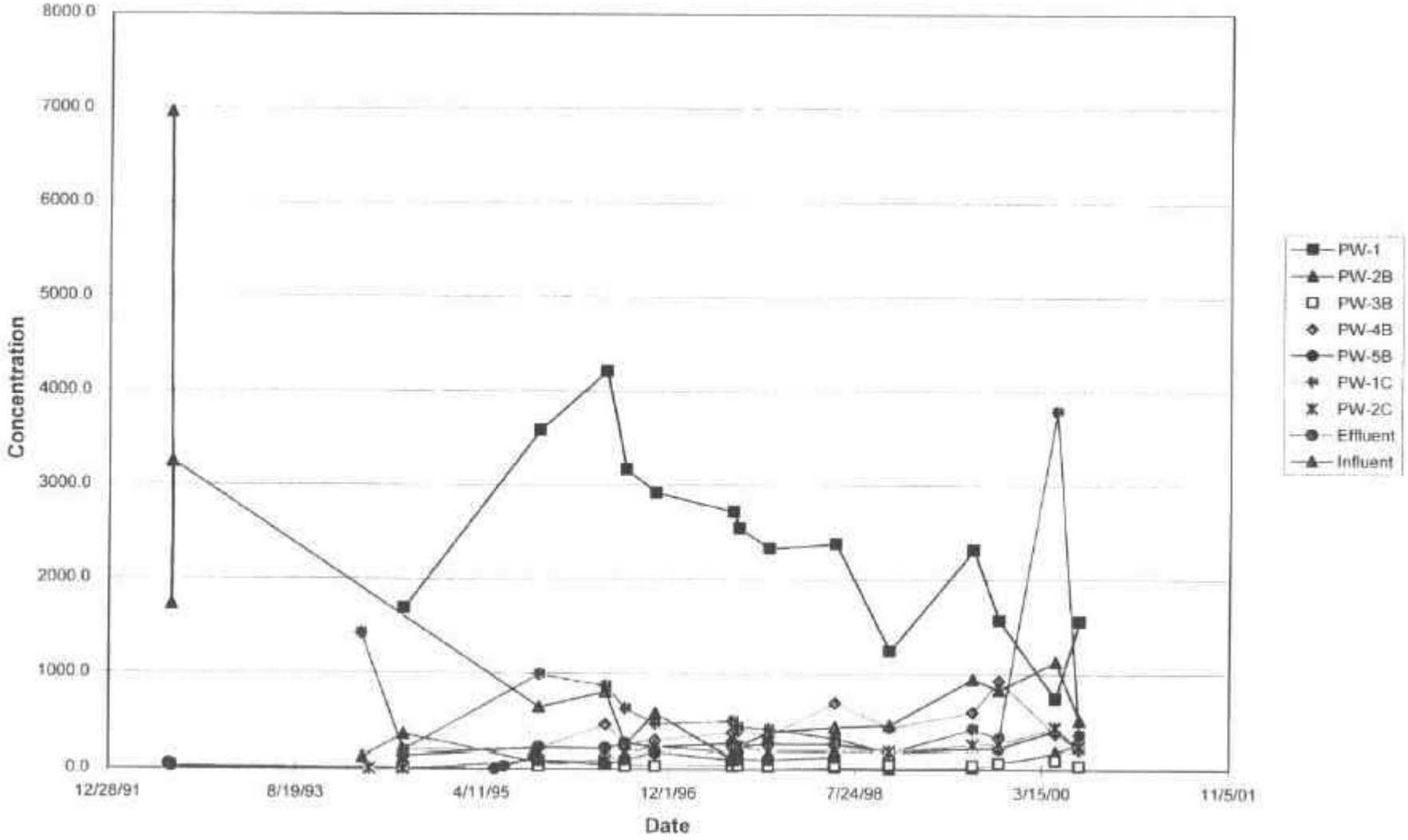
East Bethel Piezometer Water Levels



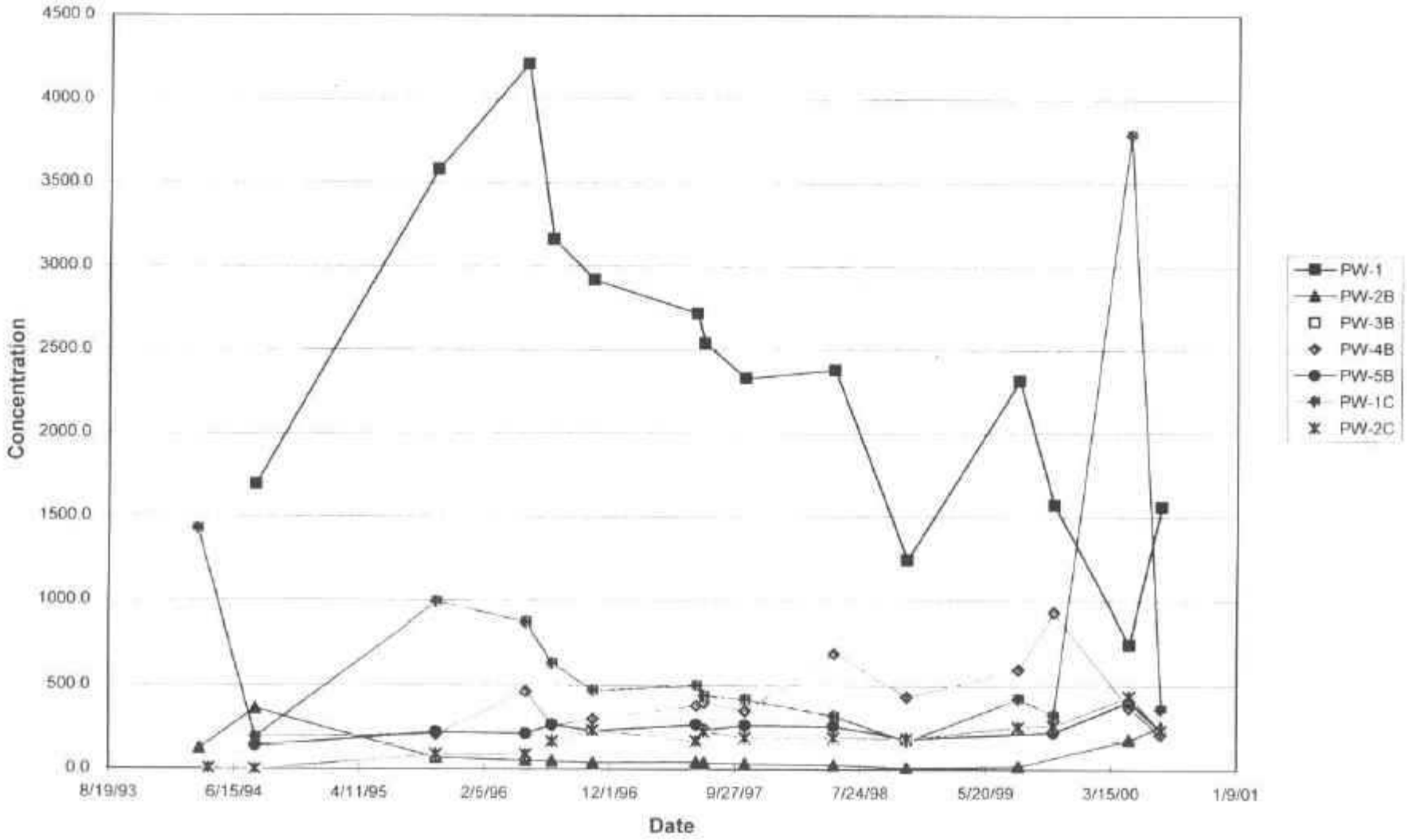
East Bethel Pumpout Wells WL



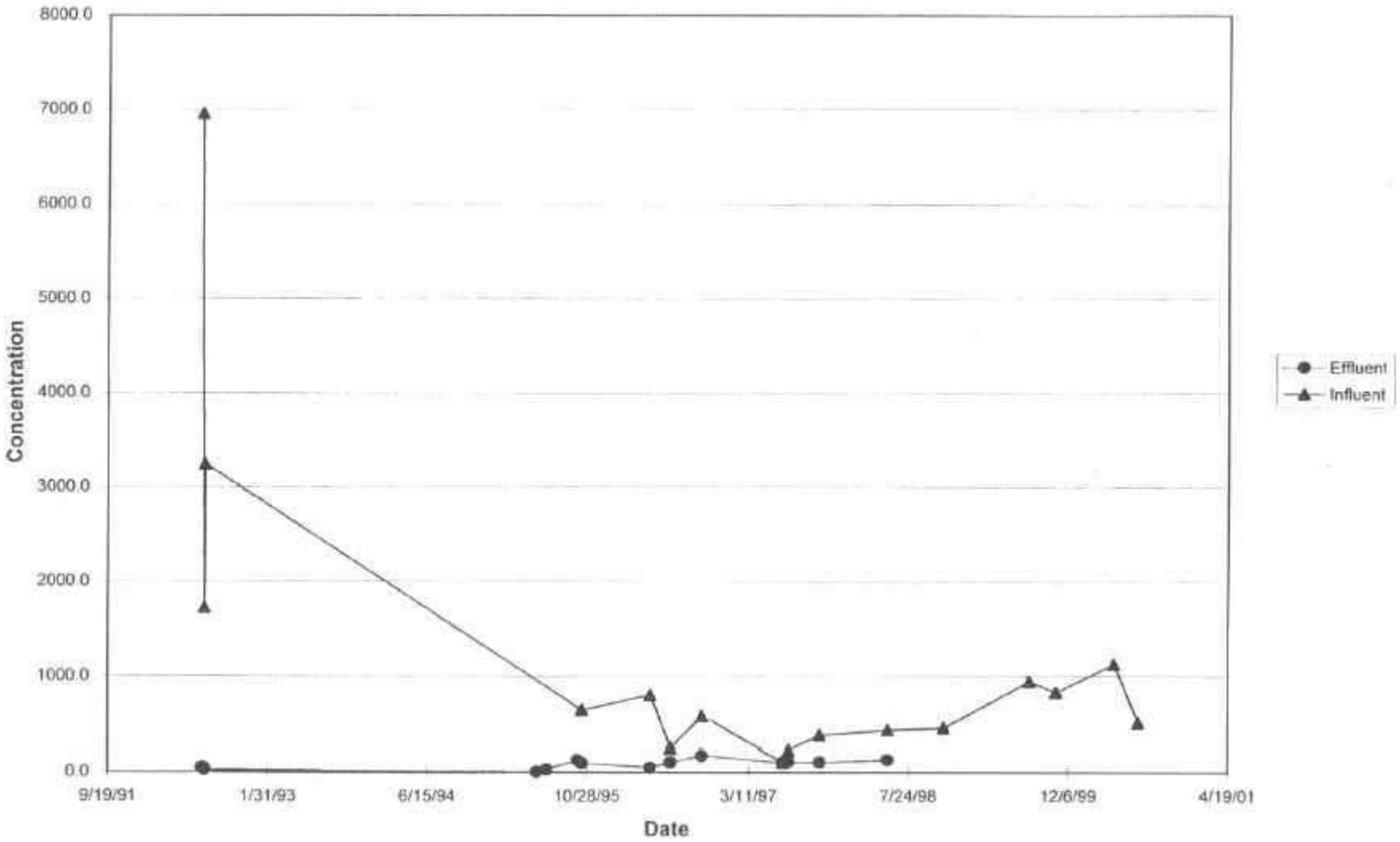
East Bethel Treatment System VOCs



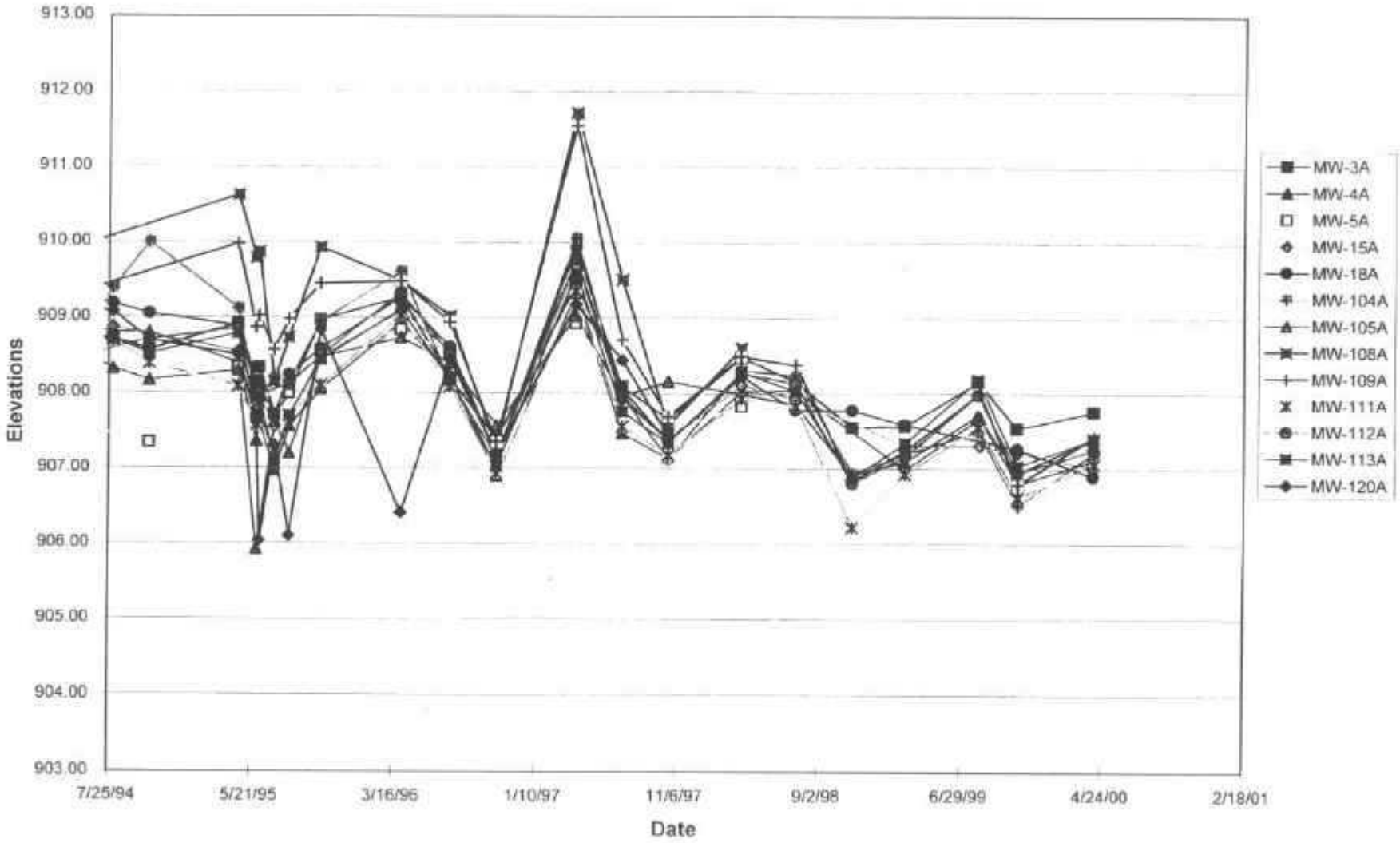
East Bethel Pumpout Wells VOCs



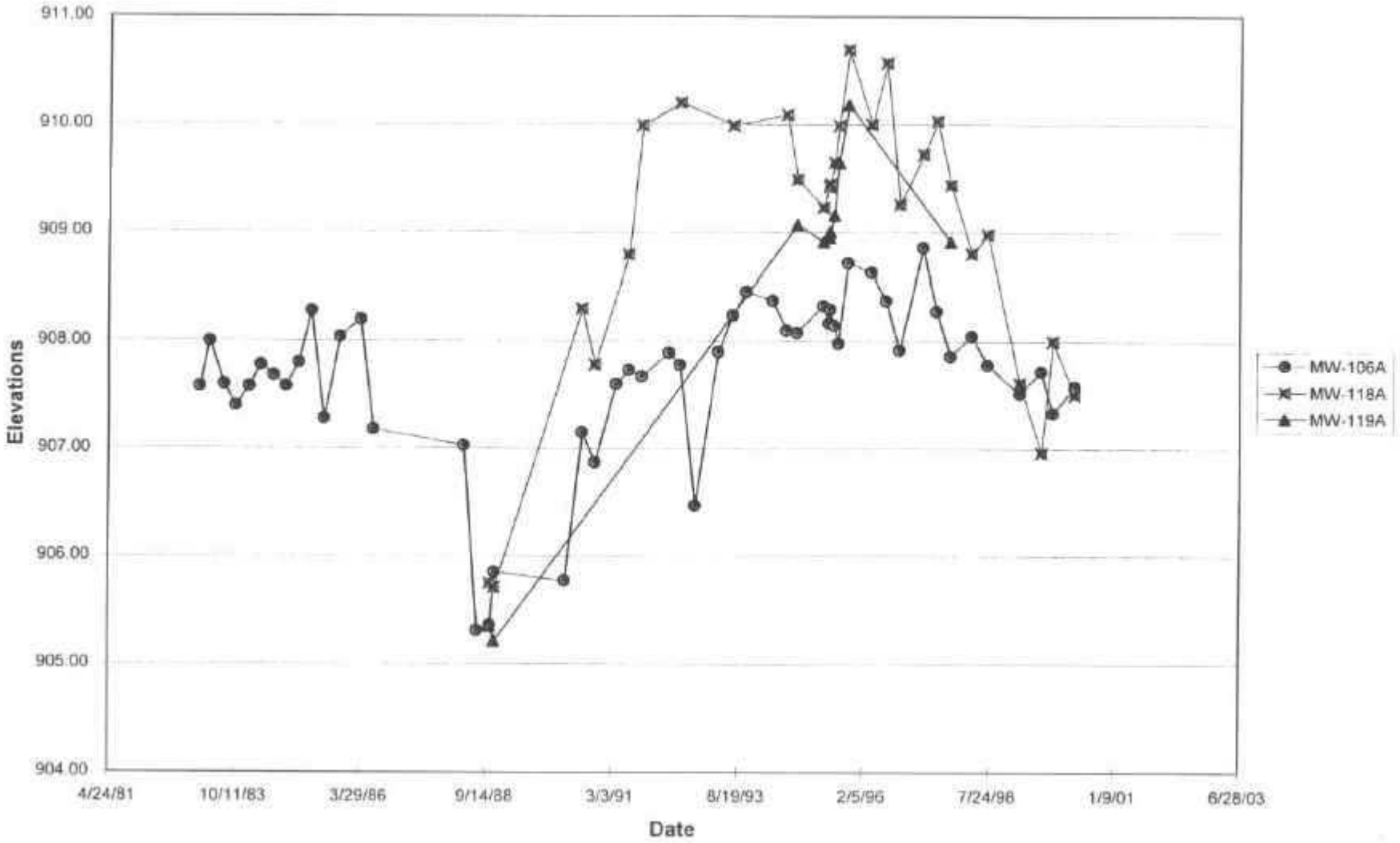
East Bethel Treatment System VOCs



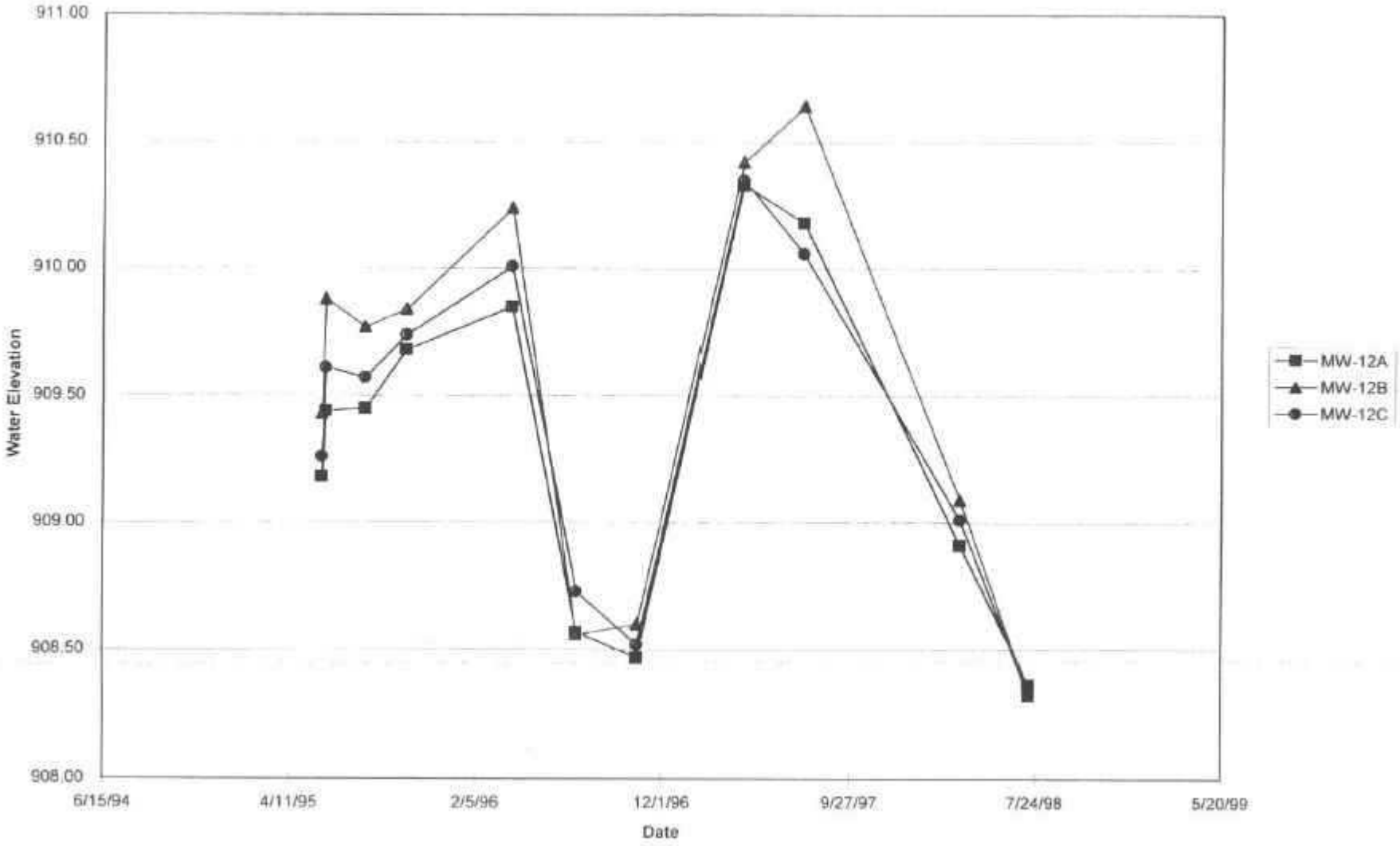
East Bethel Pumpout Confirmation Water Levels



East Bethel Background Water Levels



East Bethel 12 Nest



Ned's Lake Water Levels